Centennial Coal

ENVIRONMENTAL ASSESSMENT

Bore 8 Dewatering Facility

Springvale Colliery

Section 75W Modification

September 2012

Centennial Coal
Environment Matters

Springvale Colliery

Section 75W Modification to Development Consent
S91/06569/001

Environmental Assessment

Prepared on behalf of:

Springvale Coal Pty Limited

By:–

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Date: September 2012

Level 1, 241 Denison Street
BROADMEADOW NSW 2292

PO Box 907
HAMILTON NSW 2303

Phone: 02 4920 3000
Fax: 02 4961 3360
Web: www.gssenvironmental.com

Submission of Environmental Assessment (EA)

Prepared under Section 75W of the *Environmental Planning and Assessment Act 1979*

EA Prepared By:

Name:	Nicole Armit Senior Associate
Qualifications:	Masters of Environmental Law Bachelor of Environmental Engineering (Hons)
Company:	GSS Environmental
Address:	PO Box 907, Hamilton NSW 2303

Development Application:

Proponent Name:	Springvale Coal Pty Ltd
Proponent Address:	Level 18, BT Tower, 1 Market St Sydney
Land to be Developed:	Springvale Colliery Castlereagh Highway, Lidsdale NSW 2790 Local Government Area of Lithgow Refer to **Appendix A** for Schedule of Lands
Development Description:	Modification to development consent S91/06569/001 to allow for the construction and operation of an additional surface mine dewatering facility (Bore 8).

Declaration:

We hereby certify that we have prepared the contents of this document and to the best of our knowledge:

It contains all available information that is relevant to the environmental assessment of the proposed development to which the document relates; and

It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Name:	GSS Environmental Nicole Armit
Signature:	
Date:	September 2012

EXECUTIVE SUMMARY

Background

Springvale Colliery (Springvale) is an underground coal mine located within the NSW Western Coalfield, located approximately 15 kilometres (km) north–west of Lithgow and falls within the Lithgow Local Government Area. Springvale is owned and operated by Springvale Coal Pty Ltd (Springvale Coal), a joint venture company owned in equal share by Centennial Springvale Pty Ltd and Springvale SK Kores Pty Limited.

Springvale was originally granted development consent S91/06569/001 on 27 July 1992 by the Hon. Robert Webster, the then Minister for Planning, pursuant to Section 101 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This consent permitted the construction and operation of an underground coal mine to produce up to 3.4 million tonnes per annum of run of mine coal, along with an overland conveyor system and a coal preparation plant. Longwall mining at Springvale commenced in 1995, extracting thermal coal from the Lithgow Seam.

Springvale currently operate various remote surface mine services infrastructure within the Newnes State Forest on the Newnes Plateau, including mine dewatering bores, ventilation facilities and associated pipelines and underground cables, including the Springvale–Delta Water Transfer Scheme (SDWTS), in which water is transferred from the underground workings at Springvale to the Wallerawang Power Station for use in the cooling towers.

Proposed Modification

Springvale are seeking a modification to development consent S91/06569/001 under Section 75W of the *Environmental Planning and Assessment Act 1979* to allow for the construction and operation of an additional surface mine dewatering facility (Bore 8) and ancillary infrastructure, including an underground cable, water pipeline and access track, (referred to as the Project), to be located within the Newnes State Forest on the Newnes Plateau.

Bore 8, a fenced compound with a final footprint of 0.32 hectares (ha), will house four boreholes installed with submersible pumps, an associated switchroom with power control equipment for the operation of the pumps, and a sump. An access track and ancillary infrastructure corridor to Bore 8 totalling approximately 3.5 km in length and 10 m wide will also be established, utilising an existing track approximately 3 m in width. 11 kV cables and water transfer pipelines will be buried in the infrastructure corridor alongside the access track within the 10 m wide corridor. The Project will require clearing of approximately 4 ha of vegetation within a 120 m x 120 m drill pad at Bore 8 and along the access track; however 2.34 ha of the cleared area will be partially rehabilitated following completion of construction. A Project Application Area has been defined and is the area to be disturbed by the Project.

Bore 8 is required to facilitate the progress of coal extraction further to the east of existing workings at Springvale, so that water levels in the mine can be kept at safe and manageable levels, reducing operational risk associated with water management. The bore will form a critical part of Springvale's existing dewatering system as longwall mining progresses through approved longwalls (LWs) LW416 to LW419. Water pumped out of the underground workings at Bore 8 will be transferred via predominantly trenched pipelines to Wallerawang Power Station, as part of the existing SDWTS.

Director–General Requirements were not issued for the modification. However, the Environmental Assessment prepared in support of the proposed modification relied on the environmental assessment considerations formalised with the Department of Planning and Infrastructure in December 2011.

Potential Impacts

This Environmental Assessment, and the appended Technical Reports, documents the various studies that have been undertaken to examine potential impacts that may occur as a result of the proposed modification. The following key areas have been assessed:

- Groundwater;
- Flora and Fauna;
- Noise and Vibration;
- Cultural Heritage;
- Air Quality and Greenhouse Gas;
- Surface Water;
- Visual amenity;
- Rehabilitation and closure;
- Bushfire;
- Socio–economic and community;
- Traffic and transport;
- Soil and land resources; and
- Waste management.

A summary of the findings of each assessment is provided below.

Groundwater

Three basic groundwater systems known to exist in the region (a perched groundwater system, shallow groundwater system and a deep groundwater system) have the potential to be impacted upon by the Project. The Groundwater Assessment concludes the construction and operation of Bore 8 will have a negligible impact on the groundwater regime in the area or the groundwater dependent ecosystems that the perched and shallow groundwater systems support, these being the Newnes Plateau Hanging Swamp and the Newnes Plateau Shrub Swamp. Mitigation measures will be implemented to minimise the risk of any impacts as follows:

- Blind boring method will be used during drilling of boreholes, which will minimise mixing of groundwater between the aquifers overlying the coal seam and thus the alteration of water chemistry of each aquifer;
- Biodegradable drilling fluids will be used during the construction of the four boreholes, which will minimise contamination of groundwater;
- Any hydrocarbon and/or chemical spills will be managed appropriately within the Bore 8 compound; and
- The boreholes will be fully rehabilitated in accordance with the appropriate guidelines and will be fully back–filled with impermeable material to ensure no long–term leakage occurs.

Quantification of the potential groundwater inflows to LW416 to LW419 predict that a small increase in mine inflows from existing workings will occur, increasing from about 190 L/s to 200 L/s, and equating to approximately 17 ML/day inflow. The capacity of the SDWTS is 30 ML/day and the predicted volumes are therefore well within the capacity of the scheme. The Groundwater Assessment found the additional

inflows to Springvale from the extraction of LW416 to LW419 will have a negligible and unmeasurable impact on the local hydrogeological regime, and on surface water flows.

Bushfire

The Project Application Area is located on the Newnes Plateau, which has been identified as Bushfire Prone Land within the Lithgow Local Government Area. Given the frequency of bushfires across the Plateau, the local flora and fauna have adapted to fire, and as such adverse environmental impacts from bushfire are deemed to be low at Springvale. Notwithstanding, bushfire presents an operational risk to the maintenance of mine related infrastructure, including dewatering bores, on the Newnes Plateau.

In recognition of this risk, Springvale have established a Bushfire Management Plan (SV–MS–029, Springvale, 2010) and an associated Bushfire Management Procedure in consultation with the NSW Rural Fire Service. In accordance with the approved Bushfire Management Procedure, an Asset Protection Zone of approximately 20 m from the final footprint (excluding the sump) will be established around Bore 8. The fuel load within this Asset Protection Zone will be reduced to 10 t/ha or less through selective clearing of existing vegetation. This will ensure the risk of impact from bushfire on Bore 8 will be minimal.

Flora and Fauna

Vegetation Communities

A Flora and Fauna Assessment was conducted for the Project. Four vegetation communities were mapped and confirmed through ground truthing as occurring within the defined Study Area of the ecological survey, as follows:

- MU 30 Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland;
- MU 28 Sandstone Plateau and Ridge Scribbly Gum – Silvertop Ash Shrubby Woodland;
- MU 26 Newnes Plateau Narrow Leaved Peppermint – Silvertop Ash Layered Open Forest; and
- MU 7 Newnes Plateau Narrow Leaved Peppermint – Mountain Gum – Brown Stringybark Layered Forest.

The vegetation communities identified within the Study Area are not considered to be commensurate with any threatened species or ecological communities listed under the *Threatened Species Conservation Act 1995* or the *Environment Protection and Biodiversity Conservation Act 1999*.

Vegetation mapping in the vicinity of the Study Area identified several patches of Newnes Plateau Shrub Swamp (MU 50) and Newnes Plateau Hanging Swamp (MU 51) in the region, the nearest occurrences being approximately 100 m and 200 m, respectively, from the Project Application Area. These communities correspond to the Temperate Highland Peat Swamps on Sandstone vegetation community which is listed as a threatened ecological community under the *Environment Protection and Biodiversity Conservation Act 1999*.

Flora

One threatened flora species, *Persoonia hindii*, which is listed as endangered under the TSC Act, was identified during the field survey in the Study Area. A total of 93 individual *Persoonia hindii* plants occur within the Project Application Area and are likely to be disturbed as part of the Project. It is noted however that this would equate to 0.8% or less of the local population of the species.

Fauna

46 threatened fauna species and two insect species have been previously recorded with 10 km of the Study Area, or have potential to occur within the Study Area. Two threatened bird species (Scarlet Robin and Masked Owl) listed under the *Threatened Species Conservation Act 1995* have been recorded within the Study Area during recent surveys.

Due to the small nature of disturbance of native vegetation (approximately 4 ha, of which 2.34 ha will be rehabilitated once construction is complete) associated with the Project within the larger 25,000 ha available nearby on the Newnes Plateau, the Flora and Fauna Assessment concludes the Project is unlikely to affect the biodiversity values of the area in the long term.

Noise and Vibration

Noise modelling undertaken indicates that the noise emissions from the construction and operation of Bore 8 under calm, prevailing wind and temperature inversion conditions will have a negligible impact on the nearest sensitive receptors. This is due particularly to the isolated location of the drilling activities, over 9 km from the majority of nearest sensitive receptors, and the fact that any minor impacts will be temporary given the short time frame of six months associated with construction activities.

In addition, results of the noise model indicate that the noise levels from the operation of Bore 8 are highly likely to be inaudible at all sensitive receptors and would have a negligible impact on cumulative industrial noise levels at these locations.

With regards to vibration, operation of mobile earthmoving equipment during the construction phase of Bore 8 is likely to generate vibration. Levels are however predicted to be negligible and below levels of human perception at the nearest residential receptors, given the minimum separation distance of approximately 9 km from proposed construction activities associated with Bore 8.

Cultural Heritage

Aboriginal Heritage

A search of the Office of Environment and Heritage's (OEH) Aboriginal Heritage Information Management System was undertaken on 31 January 2012 as part of the Cultural Heritage Assessment of the Project, and identified a total of 44 Aboriginal sites within a 5 km radius centred on the Project Application Area; however none of these sites are located within the Project Application Area.

A field survey was also undertaken in conjunction with registered Aboriginal Stakeholders, and in accordance with the requirements set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). No Aboriginal sites were identified in the Study Area during the survey.

European Heritage

A search of the Australian Heritage Database, which includes the Commonwealth Heritage List, The Register of the National Estate and the National Heritage List, determined that no registered national heritage items are located within or in the vicinity of the Project Application Area. A search of the NSW Heritage Inventory also showed no heritage items of local importance are listed within the vicinity of the Project Application Area.

The Cultural Heritage assessment therefore concludes there are no constraints to the Project in respect of Aboriginal or European heritage.

Air Quality

Dispersion modelling was undertaken as part of the Air Quality Assessment for two scenarios, namely, construction and operation. The modelling results indicate that particulate emissions from the construction of Bore 8 and Springvale Colliery operations are unlikely to contribute to any exceedances of the respective NSW OEH criteria for the pollutants assessed. In particular, the predicted air quality impacts of construction and operation of Bore 8 over and above existing approved operations at Springvale are predicted to be negligible.

Greenhouse Gas

A quantitative assessment of potential Scope 1, 2 and 3 Greenhouse Gas (GHG) emissions concludes the construction and operation of Bore 8 is anticipated to contribute an additional 11,939 t CO_{2-e} per annum (Scope 1, 2 and 3). When compared with the total GHG emissions from the current site operations, this represents an increase of just 1.3% in GHG emissions. Total Scope 1 GHG emissions from Springvale, including Bore 8, would represent less than 0.02% of total NSW 2009 emissions and approximately 0.004 % of total Australian 2009 emissions.

Waste Management

Waste generated by the construction and operation of Bore 8 will include a low volume of general waste, along with fines, fluids, lubricants and waste oils associated with the drilling process. All waste, including general waste and other waste materials from construction activities, will be disposed of appropriately using licensed contractors as required, including transfer into the Springvale Pit Top waste collection system for disposal in accordance with the Waste Management Plan.

With regards to drilling activities, a suitably sized sump with appropriate erosion and sediment controls will be constructed at Bore 8 to capture all drilling fluid from borehole drilling activities. The drilling fluid will be reused and on completion of drilling activities will be pumped out by a licensed contractor for disposal at an appropriate facility.

Traffic and Transport

The Bore 8 Project will result in minor traffic movements within the Newnes State Forest. During the construction and commissioning stage of Bore 8, it is estimated that approximately four heavy vehicles and four light vehicles will travel to the bore site each day. These vehicle movements will be temporary, with this phase expected to last approximately six months. Once operational, traffic movements associated with Bore 8 will be minimal, with the occasional light vehicle trip required for maintenance and inspection purposes only, and for transfer of consumables, if necessary.

Given the minimal traffic movements associated with the Project, the traffic related impacts are anticipated to be negligible. In addition the noise assessment found that there will be no noise impacts relating to traffic as a result of the Project.

All forestry access roads and tracks utilised by Springvale are maintained in accordance with the Forest Practices Code (Part 4 – Forest Roads and Fire Trails) and the maintenance agreement in place between Springvale Coal and Forests NSW. The current practices will continue during the construction and operation of Bore 8. Inspections of access tracks will also be carried out in accordance with the approved Springvale Road Management Plan.

Surface Water

The Surface Water assessment provides information on the management of clean and dirty water, along with erosion and sediment controls for the construction and operational phases of Bore 8. No watercourse is intersected by the proposed alignment of the Bore 8 access track or drill pad.

Construction and operation of Bore 8 and the associated vehicle and equipment movements have the potential to impact on surface waters and could result in elevated sediment loads and turbidity in surface water flows, chemical and/or hydrocarbon contamination of soils and receiving waters, and changes in water flows reporting to sub–catchments.

Mitigation measures, designed, constructed and maintained in accordance with the Blue Book, will be implemented during the construction and operation phases of the Project to ensure potential impacts on the surface water environment are managed and mitigated.

Rehabilitation and Closure

Bore 8 will be a semi–permanent feature in the landscape until the infrastructure is no longer required to ensure the safe progression of underground mining activities at Springvale. Bore 8 will be rehabilitated to an end land use of open forest.

Upon completion of construction and commissioning of Bore 8, the drill pad will be partially rehabilitated to the minimum area required for the operational phase, anticipated to be a 0.32 ha platform, as well as a 20 m wide Asset Protection Zone around the final footprint. During operation of Bore 8 the fuel load within the Asset Protection Zone will be kept reduced.

Once no longer needed, Bore 8 will be decommissioned and full rehabilitation of the site will be undertaken in accordance with the Occupation Permit, and to Forest NSW's standard and satisfaction. This has previously been successfully undertaken for Bores 1 to 4 at Springvale.

Rehabilitation works will involve decommissioning of all surface infrastructure, grouting and sealing of boreholes, dozer trimming the area to facilitate appropriate drainage of surface runoff. Rehabilitation will be undertaken to ensure the final landform is commensurate with the surrounding topography and will be free-draining. Re–spreading of topsoil if available and re–seeding of the disturbed area with endemic native species where possible will be undertaken to achieve a final land use of open forest. The success of the rehabilitation activities will be monitored against performance indicators established for the rehabilitation activities.

Visual Amenity

The impact on the visual landscape within the wider Newnes State Forest is anticipated to be negligible, given the small amount of clearing associated with the Project (4 ha), as well as the temporary nature of the Project. The infrastructure will only be a semi–permanent feature in the landscape with decommissioning and rehabilitation of Bore 8 to take place when the infrastructure is no longer required. There are no permanent sensitive receptors in the vicinity of the Project Application Area and therefore any potential visual impact will be restricted mainly to the temporary recreational users of Newnes Plateau, and staff and contractors of Springvale Coal and other Centennial mines utilising the Newnes Plateau for servicing of infrastructure and exploration activities. Given the relative isolated location of Bore 8, and the low likelihood that recreational users would frequent this area, the Visual Amenity assessment concludes the impact of the Project will be minimal.

Soil and Land Resources

The Project Application Area exhibits land capability of class VI and class VII. Given the small nature of disturbance associated with the Project, and that the recommended erosion and sediment control measures will be implemented, the impacts on soil and land resources in the Project Application Area are anticipated to be negligible.

Agricultural Impact

The Project Application Area is not currently used for any traditional agricultural purposes such as grazing or cropping. However, the bushland located within the Project Application Area is managed and used by Forests NSW as part of a forestry enterprise.

During the operational phase of the Project, a rental for the site (including the access road) that compensates Forests NSW for the loss of timber production potential may be established. Preliminary estimates provided by Forests NSW indicate that the forestry resource in the Project Application Area is approximately 5 m³ per annum of sawlogs and other products. With a current value of about $80/m³, this implies a rental of $400/hectare/year (Forests NSW 2012).

There are no other agricultural enterprises within the Project Application Area or immediate locality. Therefore, the potential impact of the Project on agricultural enterprises, support services, processing and value adding agricultural industries is negligible.

Socio–Economic Impacts

Bore 8 will from a critical part of Springvale's existing dewatering system, thus enabling the continuation of approved mining operations at Springvale, and the associated ongoing employment and flow–on socio–economic benefits. With the implementation of the mitigation measures recommended in the Environmental Assessment, the potential impacts of the Project on the surrounding environment and nearest sensitive receptors are anticipated to be negligible.

Stakeholder Consultation

Consultation has been undertaken with State and Federal government agencies, the local Aboriginal Community and other relevant stakeholders, prior to, and during the preparation of the Environmental Assessment. All issues raised by stakeholders have been addressed in this Environmental Assessment.

Conclusion

Bore 8 will consist of four dewatering holes which will form a critical part of Springvale's dewatering strategy, allowing the safe extraction of coal from the already approved LW416 to LW419, and will be comparable with other dewatering bores drilled, installed and currently operating, on the Newnes Plateau. Water pumped out of the underground workings at Bore 8 will be transferred via predominantly trenched pipelines of the SDWTS to Wallerawang Power Station.

Based on the assessment of a wide range of environmental and socio–economic considerations undertaken as part of this Environmental Assessment, including consultation with relevant stakeholders, the Project is anticipated to pose negligible environmental impacts, and as such poses negligible impacts beyond those already approved under Springvale's development consent S91/06569/001.

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Overview 1
1.2 The Proponent 1
1.3 Project Team 3
1.4 Project Overview 3
1.5 Project Approval Pathway 4
1.6 Environmental Assessment Report Structure 4
1.7 Key Terms 5
2.0 SITE DESCRIPTION 6
2.1 Site Locality 6
2.2 Project Application Area 6
2.3 Study Area 6
2.4 Land Ownership 8
2.5 Existing Land Use 8
2.6 Natural Features and Topography 8
2.7 Hydrology 10
2.8 Vegetation 10
2.9 Geology and Soils 10
2.10 Climate 11
3.0 CURRENT APPROVED OPERATIONS 12
3.1 Overview 12
3.2 Existing Approvals, Licences and Authorities 12
3.2.1 Development Consents 12
3.2.2 Environment Protection Licence 15
3.2.3 Mineral Authorities 15
3.2.4 Other Approvals 16
3.3 Life of Mine and Coal Resources and Reserves 17
3.4 Mining Method 17
3.5 Mining Equipment 18
3.6 Surface Infrastructure 18
3.6.1 Springvale Pit Top Area 18
3.6.2 Springvale Coal Services Site 19
3.6.3 Remote Ancillary Infrastructure 21
3.7 Coal Handling and Transport 22
3.7.1 Stockpiles 22
3.7.2 Coal Transport 22

3.7.3 Coal Processing 23
3.8 Water Management 23
3.8.1 Overview 23
3.8.2 Water Supply and Use 24
3.8.3 Underground Mine Water Management 24
3.8.4 Springvale Pit Top Area Surface Water Management 24
3.8.5 Springvale Coal Services Site Water Management 25
3.8.6 Sewage Treatment System 25
3.9 Waste Management 25
3.9.1 Coarse Rejects 25
3.9.2 Fine Rejects 26
3.9.3 General Waste 26
3.10 Progressive Rehabilitation 26
3.11 Post Mining Closure and Rehabilitation 26
3.12 Environmental Management and Monitoring 27

4.0 PROPOSED MODIFICATION 29
4.1 Overview 29
4.2 Proposed Infrastructure 31
4.3 Drilling method 34
4.4 Location 34
4.5 Surface Tenure 35
4.6 Access 35
4.7 Construction Activities 36
4.8 Timing 37
4.9 Operating Hours and Personnel 37
4.10 Transport and Traffic Movements 37
4.11 Decommissioning and Rehabilitation 38
4.12 Environmental Management and Monitoring 38

5.0 REGULATORY FRAMEWORK 39
5.1 Approval Pathway 39
5.1.1 Director General's Requirements 39
5.2 Commonwealth Legislation 42
5.2.1 Environment Protection and Biodiversity Conservation Act 1999 42
5.2.2 National Greenhouse and Energy Reporting Act 2007 43
5.2.3 Native Title Act 1993 44
5.3 NSW State Legislation 44
5.3.1 Environmental Planning and Assessment Act 1979 44
5.3.2 Other Key NSW State Legislation 44
5.4 State Environmental Planning Policies 46
5.4.1 SEPP No. 33 – Hazardous and Offensive Development 46

5.4.2 SEPP No. 44 – Koala Habitat Protection....46
5.4.3 SEPP No. 55 – Remediation of Land....47
5.4.4 SEPP (Mining, Petroleum Production and Extractive Industries) 2007....47
5.5 Local Environmental Plans....47
5.5.1 Lithgow Local Environment Plan 1994....48
5.6 Other Planning Considerations....48
5.6.1 Strategic Regional Land Use Policy....48
6.0 CONSULTATION....49
6.1 Overview....49
6.2 State Government Consultation....49
6.2.1 Department of Planning and Infrastructure....49
6.2.2 NSW Office of Water....49
6.2.3 Office of Environment and Heritage....50
6.2.4 Hawkesbury Nepean Catchment Management Authority and Sydney Catchment Authority....50
6.2.5 Department of Trade and Investment, Regional Infrastructure and Services....50
6.2.6 Road and Maritime Services....51
6.2.7 Department of Primary Industry – Forests NSW....51
6.3 Delta Electricity....52
6.4 Lithgow City Council....52
6.5 Australian Federal Government....52
6.6 Community Consultation....53
6.7 Aboriginal Community Consultation....53
6.8 Future Consultation....55
6.9 Consultation Summary....55
7.0 ENVIRONMENTAL IMPACT ASSESSMENT....60
7.1 Identification of Issues....60
7.1.1 Pre–Project Risk Assessment....60
7.2 Groundwater....61
7.2.1 Existing Environment....62
7.2.2 Potential Impacts....64
7.2.3 Mitigation Measures....67
7.2.4 Conclusion....68
7.3 Bushfire....68
7.3.1 Existing Environment....68
7.3.2 Potential Impacts....68
7.3.3 Mitigation Measures....68
7.3.4 Conclusion....69
7.4 Flora and Fauna....69
7.4.1 Existing Environment....70
7.4.2 Potential Impacts....76
7.4.3 Mitigation Measures....79

7.4.4 Conclusion 79
7.5 Noise and Vibration 80
7.5.1 Existing Environment 80
7.5.2 Assessment Criteria 80
7.5.3 Potential Impacts 82
7.5.4 Mitigation Measures 84
7.5.5 Conclusion 85
7.6 Cultural Heritage 85
7.6.1 Existing Environment 85
7.6.2 Potential Impacts 87
7.6.3 Mitigation Measures 87
7.6.4 Conclusion 88
7.7 Air Quality and Greenhouse Gas 88
7.7.1 Existing Environment 88
7.7.2 Potential Impacts 89
7.7.3 Mitigation Measures 92
7.7.4 Conclusion 93
7.8 Greenhouse Gas 93
7.8.1 Existing Environment 93
7.8.2 Potential Impacts 94
7.8.3 Mitigation Measures 95
7.9 Waste Management 95
7.9.1 Existing Environment 95
7.9.2 Potential Impacts 96
7.9.3 Mitigation Measures 96
7.10 Traffic and Transport 96
7.10.1 Existing Environment 97
7.10.2 Potential Impacts 97
7.10.3 Mitigation Measures 97
7.10.4 Conclusion 97
7.11 Surface Water 98
7.11.1 Existing Environment 98
7.11.2 Potential Impacts 99
7.11.3 Mitigation Measures 99
7.11.4 Conclusion 100
7.12 Rehabilitation and Closure 100
7.12.1 Rehabilitation Objectives and Outcomes 100
7.12.2 Rehabilitation Procedures 101
7.12.3 Rehabilitation Performance Criteria and Monitoring Strategy 102
7.13 Visual Amenity 103
7.13.1 Existing Environment 103
7.13.2 Potential Impacts 103
7.13.3 Mitigation Measures 103
7.13.4 Conclusion 104

7.14 Soils, Land Capability and Agricultural Suitability 104
7.14.1 Existing Environment 104
7.14.2 Potential Impacts 107
7.14.3 Mitigation Measures 108
7.15 Agricultural Impact 108
7.15.1 Existing Environment 108
7.15.2 Potential Impacts 109
7.15.3 Mitigation Measures 110
7.16 Socio–Economic Impacts 110
7.17 Cumulative Impacts 111

8.0 DRAFT STATEMENT OF COMMITMENTS 113

9.0 PROJECT JUSTIFICATION AND ALTERNATIVES 115
9.1 Project Justification 115
9.2 Alternatives Considered 115

10.0 CONCLUSION 117

11.0 REFERENCES 118

12.0 ABBREVIATIONS 120

FIGURES

Figure 1 – Locality Plan 2
Figure 2 – Project Application Area 7
Figure 3 – Land Ownership and Mining Tenements 9
Figure 4 – Regional Layout 13
Figure 5 – Springvale Pit Top Layout 20
Figure 6 – Environmental Monitoring Locations 28
Figure 7 – Bore 8 Indicative Site Layout 32
Figure 8 – Vegetation Communities and Threatened Flora and Fauna 71
Figure 9 – Nearest Receptors 81
Figure 10 – Archaeological Sites 86
Figure 11 – Soil Landscapes 105
Figure 12 – Alternative Bore Location 116

TABLES

Table 1 – Long Term Meteorological Conditions (BoM station 063224) **11**
Table 2 – Springvale Development Consents **14**
Table 3 – Springvale Mining Authorities **15**
Table 4 – Other Approvals Applicable to Springvale **16**
Table 5 – Statement of Reserves at Springvale as at 31 March 2012 ..... **17**
Table 6 – Key Features of the Modification and Comparison with Existing Operations **29**
Table 7 – Borehole Specification **33**
Table 8 – Environmental Assessment Considerations presented to the DP&I **40**
Table 9 – Groundwater Licences held by Springvale **45**
Table 10 – Summary of Consultation Undertaken and Issues Raised **56**
Table 11 – Requirements for Management of Risks (Centennial Risk Standard) **61**
Table 12 – Threatened Flora Known to Occur or Potentially Occurring within the Study Area **72**
Table 13 – Threatened Fauna Known to Occur or Potentially Occurring within the Study Area **73**
Table 14 – Project Specific Construction Noise Goals **82**
Table 15 – Project–Specific Traffic Noise Criteria **82**
Table 16 – Predicted Construction Noise Levels for Scenario 1 ..... **82**
Table 17 – Predicted Construction Noise Levels for Scenario 2 ..... **83**
Table 18 – Predicted Construction Noise Levels for Scenario 3 ..... **83**
Table 19 – Predicted Operational Noise Levels from Bore 8 ..... **83**
Table 20 – Sites Types Identified within 5 km of the Study Area. **85**
Table 21 – Predicted Cumulative Background Particulate Concentrations **89**
Table 22 – Predicted Annual Average TSP Concentration – Scenario 1 (Construction and Operation) **90**
Table 23 – Predicted Annual Average PM10 Concentration – Scenario 1 (Construction and Operation) **90**
Table 24 – Predicted Annual Average PM2.5 Concentration – Scenario 1 (Construction and Operation) **91**
Table 25 – Predicted Annual Average TSP Concentration – Scenario 2 (Operation only) **91**
Table 26 – Predicted Annual Average PM10 Concentration – Scenario 2 (Operation only) **91**
Table 27 – Predicted Annual Average $PM_{2.5}$ Concentration – Scenario 2 (Operation Only) **92**
Table 28 – Predicted Incremental Annual Average Dust Deposition Rate **92**
Table 29 – Summary of Project Related Activity Data Relevant to GHG Emissions (Current and Proposed Operations) **94**
Table 30 – Summary of GHG Emissions Attributable to the Project (Current Operations and Proposed Upgrade) **95**
Table 31 – Rehabilitation Performance Criteria and Monitoring Strategy **102**
Table 32 – Rural Land Capability Classes **106**
Table 33 – Agricultural Suitability Classification System **106**
Table 34 – Statement of Commitments **113**

APPENDICES

Appendix A – Schedule of Lands

Appendix B – Development Consent S91/06569/001 and Notice of Amendments

Appendix C – Project Application Form and Political Donations Disclosure Statement

Appendix D – EPL 3607

Appendix E – Correspondence from Department of Planning and Infrastructure

Appendix F – Pre–Project Risk Assessment Register

Appendix G – Hydrogeological Impact Assessment (Aurecon, 2012)

Appendix H – Flora and Fauna Assessment (RPS, 2012)

Appendix I – Noise and Vibration Impact Assessment (SLR, 2012)

Appendix J – Cultural Heritage Assessment (RPS, 2012)

Appendix K – Air Quality and Greenhouse Gas Assessment (SLR, 2012)

Appendix L – Surface Water Assessment (GSSE, 2012)

1.0 INTRODUCTION

1.1 Overview

Springvale Colliery (Springvale) is an underground coal mine located within the NSW Western Coalfield, approximately 15 kilometres (km) north–west of Lithgow as shown in **Figure 1**. Springvale is owned and operated by Springvale Coal Pty Ltd (Springvale Coal), a joint venture company owned in equal share by Centennial Springvale Pty Ltd and Springvale SK Kores Pty Limited.

Springvale was originally granted development consent S91/06569/001 in respect of development application 11/92 (DA 11/92) on 27 July 1992 by the Hon. Robert Webster, the then Minister for Planning, pursuant to Section 101 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This consent permitted the construction and operation of an underground coal mine to produce up to 3.4 million tonnes per annum (Mtpa) of Run of Mine (ROM) coal, along with an overland conveyor system and a coal preparation plant (CPP). Longwall mining at Springvale commenced in 1995, extracting thermal coal from the Lithgow Seam.

Development consent S91/06569/001 has subsequently been modified on two occasions, in 1993 and 1994. The 1993 modification allowed for a number of amendments including changes to the Pit Top layout, a new mine entry, relocation of a conveyor route and use of the existing CPP facilities at the Western Main Colliery (now known as Springvale Coal Services). The 1994 modification related to a change in the schedule of lands and tenements associated with the development consent.

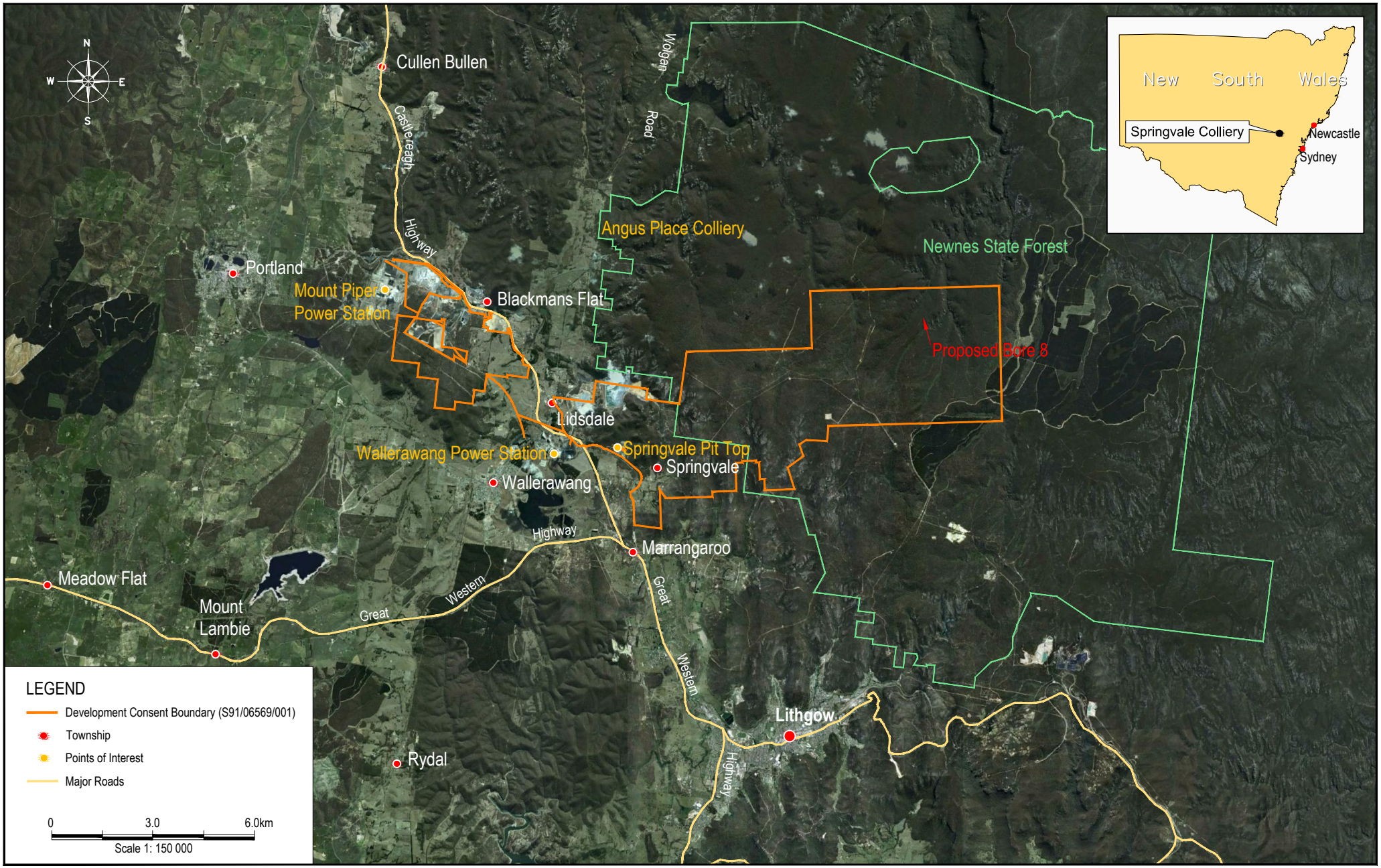
A copy of the development consent S91/06569/001 and Notice of Amendments are contained within **Appendix B**.

Springvale Coal are seeking a further modification to development consent S91/06569/001 to allow for the construction and operation of an additional surface mine dewatering facility, the Bore 8 Dewatering Facility (referred to as the Project). This Environmental Assessment (EA) has been prepared to support the application to modify development consent S91/06569/001 pursuant to Section 75W of the EP&A Act. Copies of the completed Project application form and political donations disclosure statement are contained within **Appendix C.**

In addition to describing the Project, this EA contains a comprehensive and relevant assessment of the matters pertinent to the proposed modification to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which it is permissible.

1.2 The Proponent

Springvale Coal Pty Ltd (Springvale Coal), owner and operator of Springvale, is a joint venture company owned in equal share by Centennial Springvale Pty Ltd and Springvale SK Kores Pty Limited. Centennial Springvale Pty Ltd is a wholly owned subsidiary of Centennial Coal Company Limited (Centennial), which is a wholly owned subsidiary of Banpu Singapore Pte Limited. Centennial is a coal mining and marketing company supplying thermal and coking coal to the domestic and export markets. Centennial's coal fuels approximately 40% of NSW's coal–fired electricity generating capacity.



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Regional Locality Plan

FIGURE 1

V:\CCC15-005\Figures\Final\CAD\Fg1_CCC15-005_Location Plan_120814.dwg

1.3 Project Team

GSS Environmental (GSSE) has prepared this EA on behalf of Springvale Coal. The following specialist studies were undertaken to assist with the assessment of the Project:

- Flora and Fauna Assessment – RPS Australia East (RPS);
- Cultural Heritage Assessment – RPS;
- Noise Assessment – SLR Consulting Australia Pty Ltd (SLR);
- Air Quality and Greenhouse Gas Assessment – SLR;
- Surface Water Assessment – GSSE; and
- Groundwater Assessment – Aurecon Australia Pty Ltd and Heritage Computing.

Springvale Coal personnel provided direction in terms of Project scope, technical input and finalisation of the EA.

1.4 Project Overview

Springvale Coal is seeking a further modification to development consent S91/06569/001 for the construction and operation of an additional surface mine dewatering facility, referred to as Bore 8, along with associated infrastructure including an underground cable, water pipeline and access track. The proposed location of Bore 8 and associated infrastructure is within the Newnes State Forest on the Newnes Plateau.

Bore 8, a fenced compound with a final footprint of 0.32 hectares (ha), will house four boreholes installed with submersible pumps, an associated switchroom with power control equipment for the operation of the pumps, and a sump. An access track and ancillary infrastructure corridor to Bore 8 totalling approximately 3.5 km in length and 10 m wide will also be established, utilising an existing track. 11 kV cables and water transfer pipelines will be buried in the infrastructure corridor alongside the access track within this 10 m wide corridor.

Construction of Bore 8 and the associated infrastructure corridor will involve a total disturbance of approximately 4 ha of vegetation. This includes 1.44 ha associated with the Bore 8 drill pad, and 2.6 ha with the infrastructure corridor. Within the 1.44 ha construction footprint at Bore 8, a drill pad of approximately 0.77 ha will be established, allowing sufficient room for the movement of heavy vehicles and the installation of a sump for the collection of drilling fluids, as well as the storage of all required equipment and spares within the dewatering facility compound. Outside of this drill pad, and within the construction footprint, a temporary sediment basin and other surface water controls will also be established.

Upon completion of construction the disturbance area will be partially rehabilitated, leaving a final footprint of 0.32 ha at Bore 8. However, an Asset Protection Zone of approximately 20 m around the perimeter of this final footprint will be established, in which the fuel load will be maintained at approximately 10 t/ha. Along with the partial rehabilitation of the access track and infrastructure corridor, which will be undertaken following completion of burial of the pipelines and powerlines, approximately 2.3 ha of the 4 ha initially cleared for the Project will therefore be partially rehabilitated following construction.

Bore 8 is required to facilitate the progress of coal extraction further to the east of existing workings at Springvale, so that water levels can be kept at safe and manageable levels and therefore operational risks can be reduced. The bore will form a critical part of Springvale's existing dewatering system as longwall mining progresses through approved longwalls (LWs) LW416 to LW419. Water pumped out of

the underground workings at Bore 8 will be transferred via predominantly trenched pipelines to Wallerawang Power Station, as part of the existing Springvale–Delta Water Transfer Scheme (SDWTS).

1.5 Project Approval Pathway

The NSW planning system is currently under review, and an interim new assessment system for projects of State significance commenced in NSW on 1 October 2011 following the repeal of Part 3A of the EP&A Act. Transitional provisions have been put into place, with Schedule 6A of the EP&A Act containing savings and transitional arrangements. Pursuant to Clause 12 of Schedule 6A, Section 75W of Part 3A continues to apply to modifications of the development consents referred to in Clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

Clause 8J(8) of the EP&A Regulation provides a mechanism whereby major projects approved under Part 4 of the EP&A Act can be modified under Section 75W, stating that:

> *(8) For the purposes only of modification, the following development consents are taken to be approvals under Part 3A of the Act and section 75W of the Act applies to any modification of such a consent:*
>
> *(a) a development consent granted by the Minister under section 100A or 101 of the Act,*
>
> *(b) a development consent granted by the Minister under State Environmental Planning Policy No 34 – Major Employment – Generating Industrial Development,*
>
> *(c) a development consent granted by the Minister under Part 4 of the Act (relating to State significant development) before 1 August 2005 or under clause 89 of Schedule 6 to the Act,*
>
> *(d) a development consent granted by the Land and Environment Court, if the original consent authority was the Minister and the consent was of a kind referred to in paragraph (c).*
>
> *The development consent, if so modified, does not become an approval under Part 3A of the Act.*

Given development consent S91/06569/001 was granted by the then Minister for Planning on 27 July 1992 under Section 101 of Part 4 of the EP&A Act, then, pursuant to Clause 12 of Schedule 6A of the EP&A Act, Springvale's development consent can be modified under Section 75W, and is the approval pathway for the proposed modification.

Development consent S91/06569/001, if modified, will not become an approval under Part 3A, but will remain a consent under Part 4.

1.6 Environmental Assessment Report Structure

The purpose of this EA is to enable consideration of the implications of proceeding with the proposed modification. It has been prepared in accordance with the applicable legislative framework and industry standards, and in consultation with relevant government agencies and stakeholders.

The EA is structured as follows:

Section 1: **Introduction –** outlines the Project background, introduces the Proponent and Project Team, provides a summary of the primary Project components and identifies the approval pathway.

Section 2: **Site Description –** provides an overview of the Project in terms of locality, land ownership and surrounding land uses.

Section 3: **Current Approved Operations –** provides a description of the existing approved operations.

Section 4: **Proposed Modification** – provides a detailed description of the Project.

Section 5: **Regulatory Framework** – describes the approval pathway and environmental legislative framework for the Project.

Section 6: **Consultation –** describes stakeholder consultation activities undertaken.

Section 7: **Environmental Impact Assessment –** contains an assessment of the potential implications of the Project and proposes mitigation measures to be implemented where required. This section also outlines the risk assessment process used to identify and prioritise the issues addressed within the EA.

Section 8: **Statement of Commitments –** lists the commitments proposed to be adopted for the Project in order to mitigate potential adverse impacts and ensure appropriate management and monitoring.

Section 9: **Project Justification and Alternatives –** outlines the justification for the Project and the alternatives considered.

Section 10: **Conclusion**

Section 11: **References** – lists the documents referred to within the EA.

1.7 Key Terms

For the purposes of this EA the following terminology has been used.

The Project includes all works associated with the construction, operation and eventual decommissioning of Bore 8, including the required ancillary infrastructure.

The proposed modification refers to modification of Springvale's existing development consent under Section 75W of the EP&A Act to allow the works described above as the Project.

The Project Application Area is the area that would be directly impacted by the Project. This includes a 120 m by 120 m construction footprint, and a 10 m wide and 3.5 km long access track and services corridor to the Bore 8 dewatering facility. The access track will follow existing tracks.

The Study Area is the area surveyed as part of the ecological, archaeological and surface water assessments of the Project. The Study Area includes the Project Application Area as well as an additional area outside the Project Application Area to ensure all land that has the potential to be impacted by the Project both directly and indirectly was surveyed. This allowed flexibility throughout the environmental assessment process to alter the Project Application Area if required based on outcomes of the archaeological, ecological and surface water assessments.

2.0 SITE DESCRIPTION

2.1 Site Locality

Springvale is an existing underground coal mine located approximately 15 km north–west of Lithgow and 3 km east of Wallerawang in the Blue Mountains of NSW, as illustrated in **Figure 1**. Springvale lies within the Lithgow Local Government Area (LGA) in the NSW Western Coalfields.

The Springvale Pit Top area (refer **Section 3.6.1**) is located approximately 15 km north–west of Lithgow on the Castlereagh Highway. The Springvale Coal Services site (refer **Section 3.6.2**) is located adjacent to the village of Blackmans Flat on the Castlereagh Highway, approximately 6.5 km to the north–east of the Pit Top area.

The proposed location of Bore 8 is approximately 10 km from the Springvale Pit Top, within the Newnes State Forest on the Newnes Plateau.

2.2 Project Application Area

A Project Application Area has been assigned to the proposed modification, and is defined as the area that would be directly disturbed as a result of the Project. This equates to a surface dewatering facility construction footprint of 1.44 ha, along with a 10 m wide, 3.5 km long, combined access track and services corridor to Bore 8. Of the 3.5 km, approximately 3 km is an existing track about 3 m wide, and therefore a further 7 m will need to be cleared to allow for the installation of services and movement of construction vehicles. This equates to a total of approximately 4 ha of disturbance associated with the Project.

The Project Application Area is illustrated in **Figure 2**.

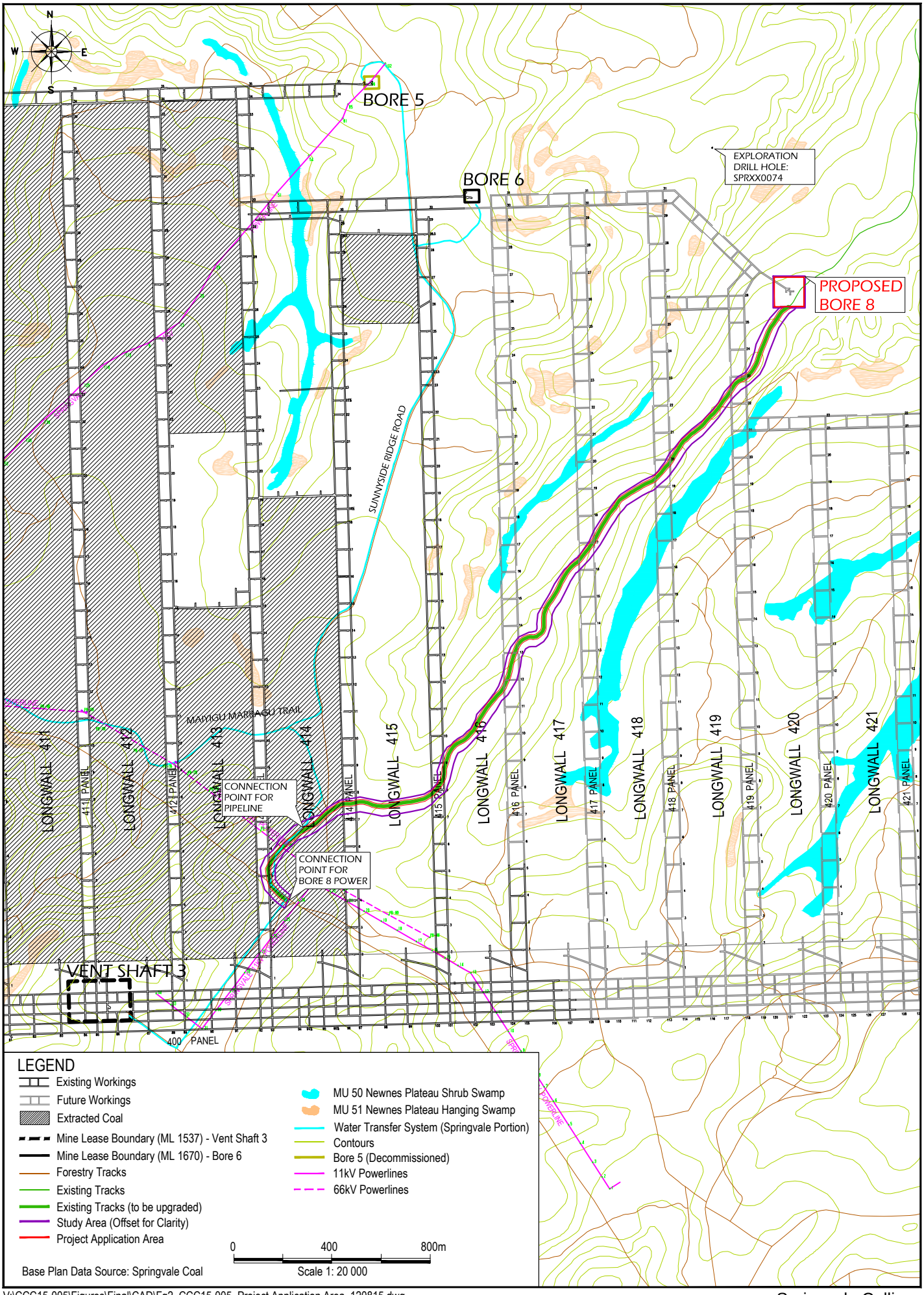
The final footprint of Bore 8 will be approximately 0.32 ha. However, a construction footprint of 0.77 ha will initially need to be cleared of vegetation to allow sufficient room for the movement of heavy vehicles and the installation of a sump to contain drilling fluids, as well as the storage of all required equipment and spares within the dewatering facility compound. Surface water controls will also need to be installed on the outside of this footprint, with disturbance therefore occurring within an area totalling 1.44 ha.

2.3 Study Area

A Study Area has also been defined for the proposed modification. This Study Area encompasses of the construction footprint for Bore 8, along with an additional approximate 30 m on each side of the existing track to be upgraded to provide a suitable access track and services corridor to the dewatering facility. The Study Area therefore encompasses the Project Application Area as well as an additional buffer to ensure all land that has the potential to be impacted by the Project both directly and indirectly was surveyed. This allowed flexibility throughout the environmental assessment process to alter the Project Application Area if required based on outcomes of the archaeological, ecological and surface water assessments.

The bushfire assessment (refer **Section 7.3**) determined that an Asset Protection Zone (APZ) should be established around the dewatering facility to minimise the risk of damage to the infrastructure from a bushfire. In addition to the final footprint of 0.32 ha, an APZ will therefore be established around Bore 8, in which vegetation will be managed so as to keep the fuel load at a reduced level. Further information on the APZ is provided in **Section 7.3**.

The Study Area is illustrated in **Figure 2**.



V:\CCC15-005\Figures\Final\CAD\Fg2_CCC15-005_Project Application Area_120815.dwg
To be printed A4

Springvale Colliery
Project Application Area

FIGURE 2

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

2.4 Land Ownership

Land ownership within the bounds of the Project Application Area and surrounding area is illustrated in **Figure 3.** As evident, the proposed Bore 8 is located on Crown Land within the Newnes State Forest.

Native title has not been extinguished over the Crown Land in the Project Application Area. Springvale will need to comply with the applicable requirements of the *Native Title Act 1993* before obtaining the necessary occupation permit and/or mining lease for Bore 8, as discussed in **Section 5.2.3.**

The Springvale mining lease area (including the Pit Top area) lies within the Lithgow LGA and the Parishes of Cox, Clwydd, Cook, Marangaroo and Lidsdale within the County of Cook. Some freehold land is located within the boundaries of the subterranean leases CL377 and ML1303; however the majority of the approved mining area lies beneath the Newnes State Forest.

2.5 Existing Land Use

Springvale is an existing underground coal mine with associated infrastructure. Numerous other underground coal mines, both operating and decommissioned, exist in the vicinity of Springvale, including the adjacent Angus Place Colliery, also owned by Centennial.

The major industrial activity within the vicinity of Springvale is power generation at the Wallerawang Power Station (approximately 2 km east of Springvale's Pit Top) and the Mount Piper Power Station (approximately 9 km northwest); both owned and operated by Delta Electricity (refer **Figure 1**). The nearest urban area is Lithgow, located approximately 15 km southeast of Springvale's Pit Top, and includes a regional shopping centre and correctional services facility. Lithgow's population is approximately 21,000.

The Project Application Area is located within the Newnes State Forest, an area of State Forest that comprises approximately 25,000 ha of pine plantation and remnant vegetation that is selectively logged under Forest NSW tenure. In addition to the timber industry, the Newnes State Forest also supports a number of recreational land uses, with activities dependent of natural landscape qualities. Users of the area for recreational purposes include bushwalkers, hunters, cyclists, motorcyclists and motorists.

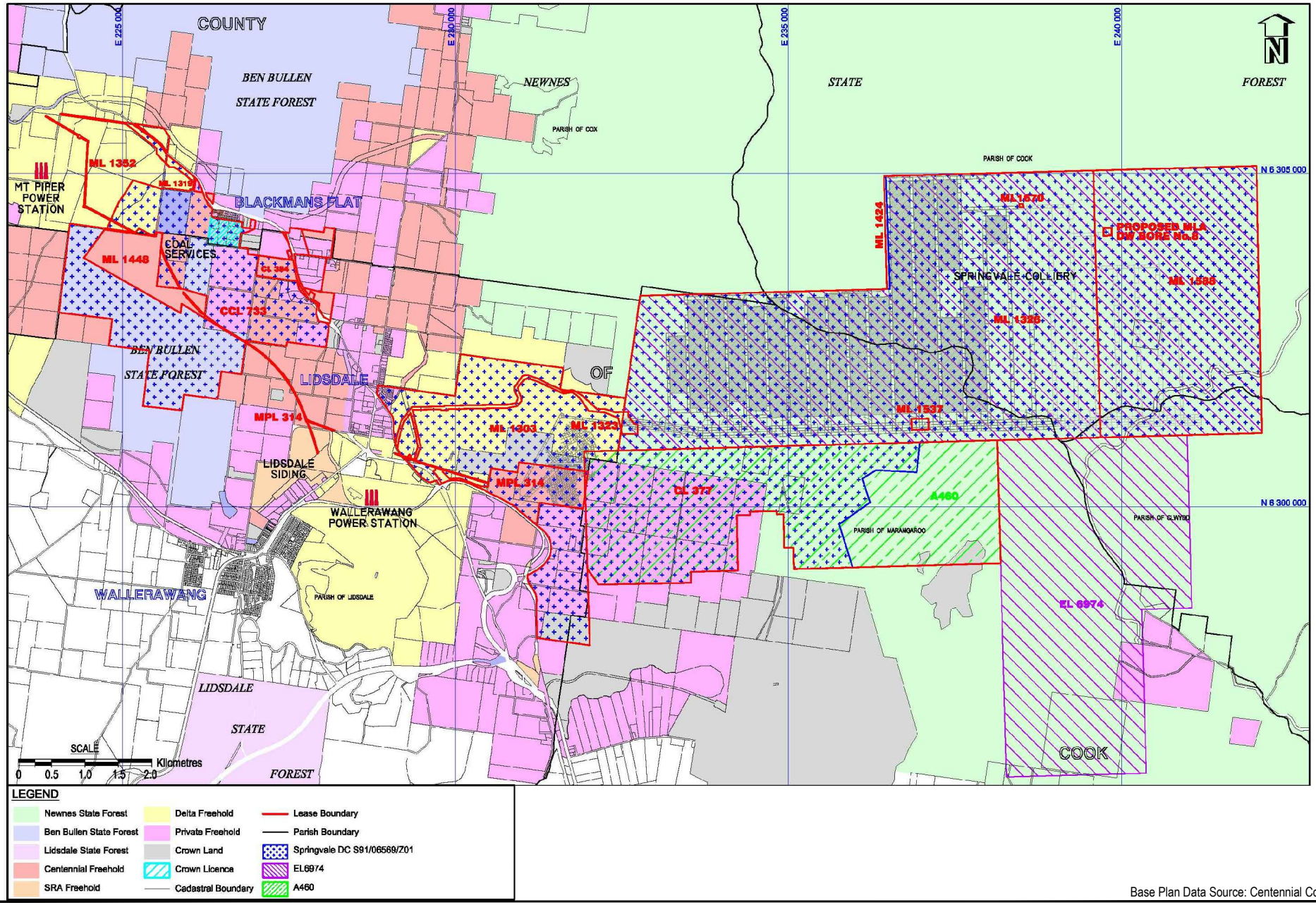
2.6 Natural Features and Topography

The topography of the region consists of rugged mountain ranges and plateaus characterised by sheer and benched cliffs, and steep sided gorges. The rugged topography is dissected by numerous streams and gullies often bordered by discontinuous belts of flat undulating land.

The proposed alignment of the access track to Bore 8 follows an existing fire trail that gently undulates along a ridgeline that dips to the north, descending (approximately) 90 m to the proposed Bore 8 location.

The majority of Springvale's mining leases lie within the Newnes Plateau, which is a relatively undulating plateau occurring between 1,000 m and 1,180 m above sea level (ASL). The plateau forms part of the divide between the Wolgan and Coxs River valleys. It consists of a number of connecting, wide, gently undulating ridges, dissected by relatively steep–sided valleys with the floors of the creeks and gullies occurring between 960 m and 980 m ASL. Sandstone cliffs over 40 m in height can be found in the south western and north eastern corners, and along the southern boundary of the lease area. In general, however, the sandstone cliffs range between 10 m and 40 m in height throughout the area. Some swamps occur within the headwater valleys and are controlled by the flat topography and impervious shale layers. These swamps include Sawyers Swamp, and others which are unnamed also occur along the tributaries of both Carne and Marrangaroo Creek.

The Pit Top area, and the conveyor route, in contrast, are characterised by relatively open and flat valleys of the upper Coxs River and tributaries.



Base Plan Data Source: Centennial Coal PC4180

To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Land Ownership and Mining Tenements

FIGURE 3

V:\CCC15-005\Figures\Final\CAD\Fg3_CCC15-005_LandOwnership_120814.dwg

2.7 Hydrology

The Wolgan, Capertee, Coxs and Macquarie Rivers represent the major permanent watercourses in the region; with most other watercourses being intermittent. The rivers and streams within the region belong to three major drainage basins: the Capertee River catchment; the Coxs River catchment; and the Turon–Macquarie River catchment.

More specifically, Springvale lies on the border of the upper catchment of the Wolgan River (within the Hawkesbury–Nepean Catchment) and the catchment of the Coxs River. The Wolgan River flows in a north north–westerly direction and is a tributary of the Capertee River, which ultimately joins the Colo River, the Hawkesbury River and Broken Bay. The Coxs River on the other hand flows in a southerly direction and its catchment is part of the greater Warragamba Dam Catchment. The Warragamba Dam Catchment lies within the Sydney drinking water catchment.

Bore 8 is located in the headwaters of the Carne Creek catchment, a sub–catchment of the Wolgan River catchment and the Hawkesbury–Nepean Catchment.

2.8 Vegetation

The environment surrounding the Project Application Area is generally well vegetated consisting of open forest habitat. Four native vegetation communities have been identified within the Study Area (RPS, 2012a), and are as follows:

- Mapping Unit (MU) 30 Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland;
- MU 28 Sandstone Plateau and Ridge Scribbly Gum – Silvertop Ash Shrubby Woodland;
- MU 26 Newnes Plateau Narrow Leaved Peppermint – Silvertop Ash Layered Open Forest; and
- MU 7 Newnes Plateau Narrow Leaved Peppermint – Mountain Gum – Brown Stringybark Layered Forest.

Further detail on existing vegetation is provided in **Section 7.4**.

2.9 Geology and Soils

The region typically comprises of deeply incised gorges with sandstone bed–rock, steep sided cliffs and pagodas, narrow incised valleys with spring fed creek lines and inter–bedded sandstone conglomerate rocks. The underlying strata of the Newnes Plateau comprise mostly sandstones of the Triassic Narrabeen Group, which are made up of interbedded siltstone, sandstone and conglomeratic sandstone.

The Narrabeen Group rocks near the surface belong to the Grose Sub–group, and include the Banks Wall Sandstone, the uppermost stratigraphic unit which is deeply weathered and generally very friable. The sandstone, which is up to 200 m thick in this region, is underlain by the Mt York Claystone, a thin, fine–grained claystone that appears to limit vertical infiltration of groundwater from the overlying strata (Sinclair Knight, 1992).

The Illawarra Coal Measures underlay the Narrabeen Group rocks, comprising interbedded sandstone, siltstone, shale and coal, and are approximately 120 m thick in this area. The Illawarra Coal Measures include the Lidsdale/Lithgow Seam, which has been mined at Springvale since 1995. The basement comprises metasediments and granitic plutons which underlie the Springvale lease.

Three soil landscape units underpin the Project Application Area; Newnes Plateau (np) landscape unit which occurs on the undulating crests higher in the catchment and Wollangambe (wb) unit which occurs

on the slopes. A small part of the Study Area is underpinned by the Medlow Bath (mb) unit (King, 1993). Further details on soil landscapes and land capability can be found in **Section 7.13**.

2.10 Climate

Springvale monitors climatic conditions using an automated weather station located within the Pit Top area. Additional rainfall data is collected from a tipping bucket rain gauge located on the Newnes Plateau. Long–term average climate data has been sourced from an automated weather station 063224 operated by the Bureau of Meteorology (BoM) at Lithgow (Birdwood Street), and is summarised in **Table 1**.

Table 1 – Long Term Meteorological Conditions (BoM station 063224)

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Temperature														
Mean maximum temperature (°C)	25.5	24.7	22.4	18.4	14.3	11.1	10.4	12.0	15.4	18.7	21.5	24.5	18.2	1912 2006
Mean minimum temperature (°C)	11.9	12.1	10.1	6.7	3.9	1.8	0.7	1.3	3.4	6.0	8.1	10.4	6.4	1912 2006
Rainfall														
Mean rainfall (mm)	94.3	83.8	83.9	62.7	63.0	67.6	67.6	63.4	58.9	67.7	70.0	76.1	858.5	1889 2006
Mean number of days of rain ≥ 1 mm	8.3	7.6	8.4	7.0	7.6	8.8	8.4	8.3	7.9	8.2	7.7	7.6	95.8	1889 2006
Other daily elements														
Mean number of clear days	7.4	5.3	7.1	8.2	7.4	6.3	8.1	9.5	8.6	7.3	6.7	8.4	90.3	1965 2006
Mean number of cloudy days	12.0	12.1	12.4	10.0	13.0	13.7	12.4	10.9	10.2	11.4	11.4	10.0	139.5	1965 2006
9 am conditions														
Mean 9am temperature (°C)	18.7	17.8	15.8	12.4	8.5	5.6	4.7	6.4	10.0	13.5	15.7	18.1	12.3	1913 2006
Mean 9am relative humidity (%)	64	70	73	76	81	82	79	73	64	60	60	61	70	1912 2006
Mean 9am wind speed (km/h)	6.7	6.1	6.5	7.5	7.2	8.3	8.4	10.2	10.9	9.8	8.9	7.9	8.2	1965 2006
3 pm conditions														
Mean 3pm temperature (°C)	23.9	22.9	20.8	17.4	13.3	10.0	9.3	10.8	13.7	17.0	19.7	22.7	16.8	1965 2006
Mean 3pm relative humidity (%)	54	58	60	59	66	67	66	56	54	51	53	50	58	1987 2006
Mean 3pm wind speed (km/h)	10.3	9.0	8.8	9.2	9.6	10.6	11.4	13.3	12.7	11.8	11.3	11.3	10.8	1965 2006

Red = Highest Value Blue = Lowest Value

The climate in the region is typical of a cool temperate mountain climate, characterised by cold winters and warm summers. The highest temperatures occur throughout December, January and February, with the coolest temperatures occurring in July. Whist rainfall is reasonably well distributed throughout the year; there is a noticeable peak in the summer months and a marginally lower rainfall in winter and early spring. On average, January is the wettest month of the year and September is the driest. Snow and/or sleet are common in winter months.

3.0 CURRENT APPROVED OPERATIONS

3.1 Overview

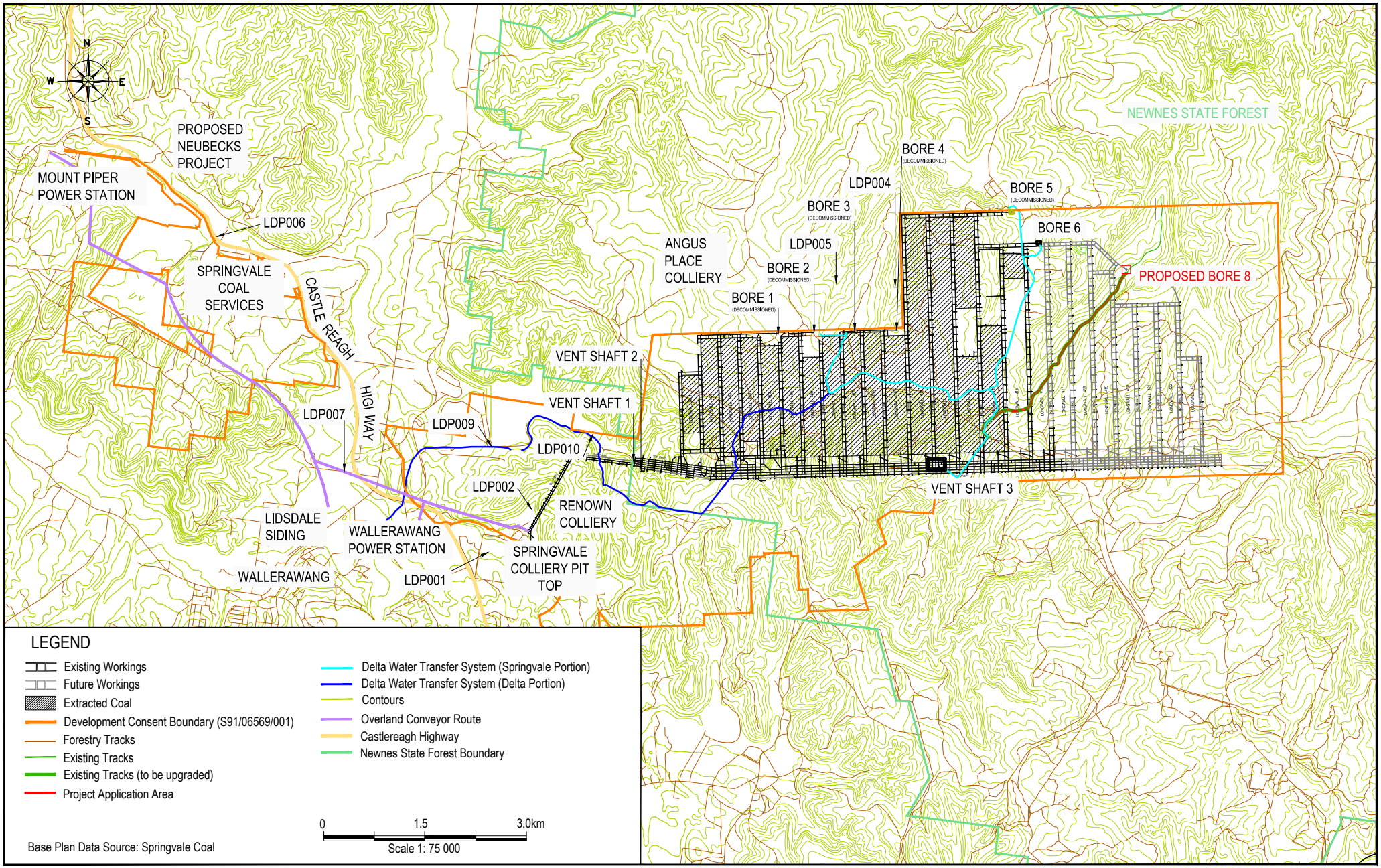
Springvale commenced mining in 1995, extracting coal from the Lithgow seam using longwall mining techniques. The mine supplies coal to both domestic and export markets. Coal for export markets is processed prior to transport to Port Kembla. The principal components of the currently approved Springvale operation are illustrated on **Figure 4** and include the following:

- An underground longwall coal mine with maximum production levels of 3.4 Mtpa for the domestic and export markets;
- Associated Pit Top area containing surface infrastructure including mine offices, bathhouse, water management infrastructure, portal, sewage treatment plant, wash–down facilities, ROM coal stockpile area and a conveyor system to deliver ROM coal to the surface into the Crushing and Screening Plant via thee Rill Tower;
- Remote surface mine services infrastructure located on Newnes Plateau, including mine dewatering bores, ventilation facilities and associated pipelines and underground cable, the SDWTS and the licensed discharge points;
- A CPP at Western Main Colliery (now known as the Springvale Coal Services site) that washes coal for the export market; including associated coal stockpiles and reject emplacement area; and
- An overland conveyor system that delivers coal to the CPP, or the Wallerawang or Mount Piper Power Stations, as well as delivering washed coal from Springvale Coal Services to the existing Lidsdale Siding coal loading facility for loading to trains bound for Port Kembla and overseas markets.

3.2 Existing Approvals, Licences and Authorities

3.2.1 Development Consents

Development consent S91/06569/001 was approved by the then Minister for Planning on 27 July 1992, pursuant to Section 101 of the EP&A Act, permitting the construction and operation of an underground coal mine, and associated CPP and overland conveyor system at Springvale. Two modifications to development consent S91/06569/001 have been approved since 1992, along with the granting of two approvals through Lithgow City Council, all of which are summarised in **Table 2**.



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Regional Layout

FIGURE 4

V:\CCC15-005\Figures\Final\CAD\Fg4_CCC15-005_Springvale Colliery Regional Layout_120820.dwg

Table 2 – Springvale Development Consents

Ref No.	Description	Issued By	Issue/Consent Date	Expiry/ Review Date
S91/06569/001 (DA 11/92)	Original development consent under Section 101 of EP&A Act permitting the construction and operation of an underground coal mine, overland conveyor and CPP.	Department of Planning (now Department of Planning and Infrastructure (DP&I))	27 Jul 1992	28 Sept 2014
S91/06569/Z01 (DA 11/92)	Modification to the original development consent under Section 102 of the EP&A Act to allow the following: • Modifications to the Pit Top layout; • Modifications to storm water controls; • New mine entry point; • Relocation of mine ventilation shafts; • Extension of existing road to access shafts; • Use of the existing Springvale Coal Services CPP; and • Relocation of existing conveyor route to the Springvale Coal Services CPP.	Department of Planning (now DP&I)	29 Jun 1993	28 Sept 2014
S91/06569/Z01 (DA 11/92)	Modification to the original development consent under Section 102 of the EP&A Act for the replacement of Attachment A (the land description) with Attachment 1 (Schedule of Lands and Tenements).	Department of Planning (now DP&I)	11 Apr 2004	28 Sept 2014
EPBC 2011/5949	Mining of Longwalls 415, 416 and 417 at Springvale Colliery, NSW	Commonwealth Department of Sustainability, Environment, Water, Populations and Communities	14 Mar 2012	19 Mar 2032
DA 326/02	Application under Section 81(1)(a) of the EP&A Act for the construction and operation of a coal conveyor from Castlereagh Highway to Wallerawang Power Station.	Lithgow City Council	20 Sept 2002	20 Sept 2007 (if not commenced)
DA 461/02	Application under Section 81(1)(a) of the EP&A Act for the construction and operation of a Ventilation Shaft 3 facility on the Newnes Plateau.	Lithgow City Council	23 Jan 2003	23 Jan 2008 (if not commenced)
DA 461/02 S96 002/12	Upgrade of Ventilation Shaft 3 facility	Lithgow City Council	30 May 2012	23 Jan 2008 (if not commenced)

3.2.2 Environment Protection Licence

Coal mining and coal works are premises–based activities under Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act). On this basis, the occupier of the premises must hold an Environment Protection Licence (EPL) administered by the Environment Protection Authority (EPA) under Section 43(b) of the POEO Act.

Springvale operates under EPL 3607, which authorises mining for coal to a scale of up to 3.5 Mtpa and coal works up to a scale of 5 Mt loaded per annum. EPL 3607 also covers operations at the Springvale Coal Services site. A copy of the EPL is contained within **Appendix D**.

3.2.3 Mineral Authorities

Springvale operates under a number of mineral authorities, details of which are provided in **Table 3**. The areas to which these authorities apply are shown in **Figure 3**.

Table 3 – Springvale Mining Authorities

Reference	Title	Issue Date	Expiry Date	Area (ha)
Springvale				
CL 377	Coal Lease 377	24 Feb 1992	9 Apr 2025	1,105
A 460	Authorisation 460	07 Jul 1992	6 Jun 2015	1,105
ML 1303	Mining Lease 1303	15 Dec 1992	14 Dec 2013	713
ML 1323	Mining Lease 1323	3 Aug 1993	3 Aug 2014	30.24
ML 1326	Mining Lease 1326	28 Sept 1993	18 Aug 2024	2,157
EL 6974	Exploration Licence 6974	13 Dec 2007	13 Dec 2012	4,385
ML 1537	Mining Lease 1537	16 Jun 2003	25 Jun 2024	4.13
ML 1588	Mining Lease 1588	19 Oct 2006	19 Oct 2027	975.5
ML 1670	Mining Lease 1670	17 Feb 2012	17 Feb 2033	0.3
Springvale Coal Services				
CCL 733	Consolidated Coal Lease 733	23 May 1990	3 July 2027	723.5
ML 204	Mining Lease 204	27 May 1910	27 May 2012	10.12
ML 564	Mining Lease 564	2 May 1922	2 May 2023	19.75
PLL 133	Private Lands Lease 133	10 Aug 1922	10 Aug 2024	16.51
ML 1319	Mining Lease 1319	5 July 1993	5 July 2014	5.71
ML 1352	Mining Lease 1352	23 Jun 1994	23 Jun 2015	8.2 in 2 parts
ML 1448	Mining Lease 1448	31 May 1999	31 May 2020	95.16
CL 361	Coal Lease 361	17 Jul 1990	16 July 2032	14.26
CL 394	Coal Lease 394	27 May 1992	27 May 2013	17.0
MPL 314	Mining Purposes Lease 314	3 Aug 1993	2 Aug 2014	96.4 in 2 parts

The underground mine is assessed through ML1303, and longwall mining is currently being undertaken in ML1326. The Springvale Coal Services site and overland conveyor route are leased under CCL733 and MPL314 and ML1352, respectively.

3.2.4 Other Approvals

Springvale operates in accordance with a number of other approvals, which are summarised in **Table 4**.

Table 4 – Other Approvals Applicable to Springvale

Type	File/Approval Number	Regulatory Authority	Issue Date	Details
Mining Operations Plan (MOP)	09/8465	Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS)	24 May 2010	Variation Approval for MOP – 2009 to 2016.
Groundwater Licences (*Water Act 1912*)	10BL603519	NSW Office of Water (NOW)	24 Feb 2010	Dewatering Bore 6.
	10BL602017	NOW	04 Sep 2007	Pit Top Collection System.
	10BL601863	NOW	04 Sep 2007	Dewatering borehole at Ventilation Shaft 3 compound.
Subsidence Management Plan	04/1673	DTIRIS	6 Mar 2006 12 Nov 2008 Feb 2009 Sep 2009 22 Oct 2010 23 May 2011 17 Jan 2012	Approval for LW411–LW418 SMP Variation LW414–LW418 SMP Variation LW413 SMP Variation LW413 SMP Variation LW414 SMP Variation LW416–LW417 SMP Variation LW415
Section 138 Approval (*Coal Mines Regulation Act 1982)*	C05/6330	DTIRIS	04 Jan 2006	Approval to extract LW411 and LW412 within the Lithgow Seam.
Clause 88 Approval *(Coal Mine Health and Safety Regulation 2006)*	09/2010	DTIRIS	27 Oct 2009	Variation approval to extract LW414 within the Lithgow Seam.
Section 95 Certificate *(Threatened Species Conservation Act 1995)*	1117191	OEH	02 Aug 2010	Undertake geotechnical and geophysical investigations within Newnes Plateau Shrub Swamp.
Section 95 Certificate *(Threatened Species Conservation Act 1995)*	1111270	OEH	10 Feb 2010	Hand removal of weeds within Newnes Plateau Shrub Swamp.
Occupation Permit (*Forestry Act 1916*)	2349	Forests NSW	01 Oct 2002	Permit to occupy Newnes State Forest for activities associated with surface facilities and mineral exploration.
Dangerous Goods Licence	35/027897	WorkCover NSW	–	Dangerous goods on premises.

Type	File/Approval Number	Regulatory Authority	Issue Date	Details
Radiation Gauge	29346		12 Feb 2004	Licence to sell/possess.

3.3 Life of Mine and Coal Resources and Reserves

Springvale Coal has an approved life of 21 years under development consent S91/06569/001, expiring on 28 September 2014, and is permitted to produce up to 3.4 Mtpa of ROM coal. The maximum total mineable tonnage from the current SMP approval area (LW411 – LW418) is 37,091,835 tonnes, assuming a resource recovery of 70%.

A summary of the coal reserves at Springvale as at 31 March 2012 is provided in **Table 5**.

Table 5 – Statement of Reserves at Springvale as at 31 March 2012

Remaining Resources and Reserves (Million of tonnes (Mt))							
Remaining Resources (Mt)				Remaining Reserves (Mt)			
Measured	Indicated	Inferred	Total	Proved	Probable	Total	Marketable
101.7	60.5	0.0	162.2	28.8	25.8	54.7	45.4
Source: Malcolm Ives and Mark Levey, *Coal Resource and Reserve Statement*, Centennial Coal Company Limited, 31 March 2012							

The combined Lidsdale/Lithgow coal seam within the Springvale leases is approximately 7 m in thickness, and Springvale currently mines the lowest 3.0 m of coal in development and 3.2 m on extraction from the Lithgow seam, which is the only economic coal resource within the Springvale leases. The coal forming the upper section of the combined coal seam has a high ash and dirt content, and is considered uneconomic.

3.4 Mining Method

Springvale currently extracts thermal coal from the Lithgow seam via longwall mining techniques. Coal is extracted from the approved 305 m wide longwall face with an average extraction height of 3.2 m. The extraction blocks vary in length from around 1.8 km for the first 11 longwalls, and up to 3.0 km for the remainder of the mine plan.

Springvale has recently procured a new longwall which will replace the existing ageing longwall in use at the mine. This longwall has a slightly narrower face of 250 m rather than the 305 m wide face of the current longwall. The new longwall equipment will be preinstalled in LW416 prior to the completion of LW 415. The associated changes in the mine plan and possible subsidence impacts will be addressed in the revised SMP and MOP process managed by the Division of Resources and Energy (DRE) of DTIRIS.

The mine layout is constrained by the lease boundary and subsidence protection zones designed to protect sensitive surface escarpment areas. The use of blasting underground is limited to increasing roadway clearance in the case of convergence. Blasting is carried out in accordance with the *Coal Mine Health and Safety Regulation 2006*.

Entry to the mine is via two in–seam portals. These entries extend for approximately 2,500 m past the abandoned Renown Colliery workings (refer **Figure 4**) prior to connecting with the five heading main roadways. The main mine entry is adjacent to the bathhouse and is a dedicated transport route; the other is used as a belt road with walking access for a second egress if required.

3.5 Mining Equipment

Springvale utilises the mining equipment as listed below.

Old Longwall (305 m wide face – in use until completion of LW 415)

- 3.3 kV Joy 4LS/5 double ended ranging drum shearer;
- 200 x 800 tonne Joy shield supports;
- Five x 1,050 tonne Joy shield supports (two at the tailgate and three at the maingate); and
- 3.3 kV, 1,260 kW armoured face conveyor.

New Longwall (250 m wide face – to be used from LW 416 onwards)

- 3.3 kV Joy 7LS/2 double ended ranging drum shearer;
- 145 x 1050 tonne Joy shield supports; and
- 3.3 kV, 1700 kW armoured face conveyor.

Development

- Four Joy 12CM30 Continuous Miners;
- Five Joy 15SC32 Shuttle Cars;
- Two Stamler Ratio Feeders;
- One Hexham Ratio Feeder;
- Two 18 m^3/s ABB auxiliary fans;
- Two 13 m^3/s ABB auxiliary fans;
- Four mobile roof bolting rigs;
- Associated diesel personnel and equipment transporters and loaders; and
- Associated pumping and electrical reticulation equipment.

3.6 Surface Infrastructure

3.6.1 Springvale Pit Top Area

Springvale's existing surface facilities and mining related infrastructure are primarily located at the mine Pit Top area. These include:

- Administration building, visitor and employee parking areas;
- Bathhouse with associated facilities;
- Various workshops, service buildings, material storage and compressor sheds;
- Men and materials drift for access to underground workings;

- Coal conveyor drift and coal conveyor drive to transport coal from underground workings to the surface;
- Sewage treatment facility;
- ROM coal stacker (the Rill Tower), 85,000 tonne stockpile and coal reclaim system,
- Crushing and Screening Plant which delivers coal onto the overland conveyor to Mt Piper and Wallerawang power stations;
- Substations and switch–room; and
- Water supply dams and pollution control facilities.

The existing layout of the Springvale Pit Top surface facilities and infrastructure is shown on **Figure 5**.

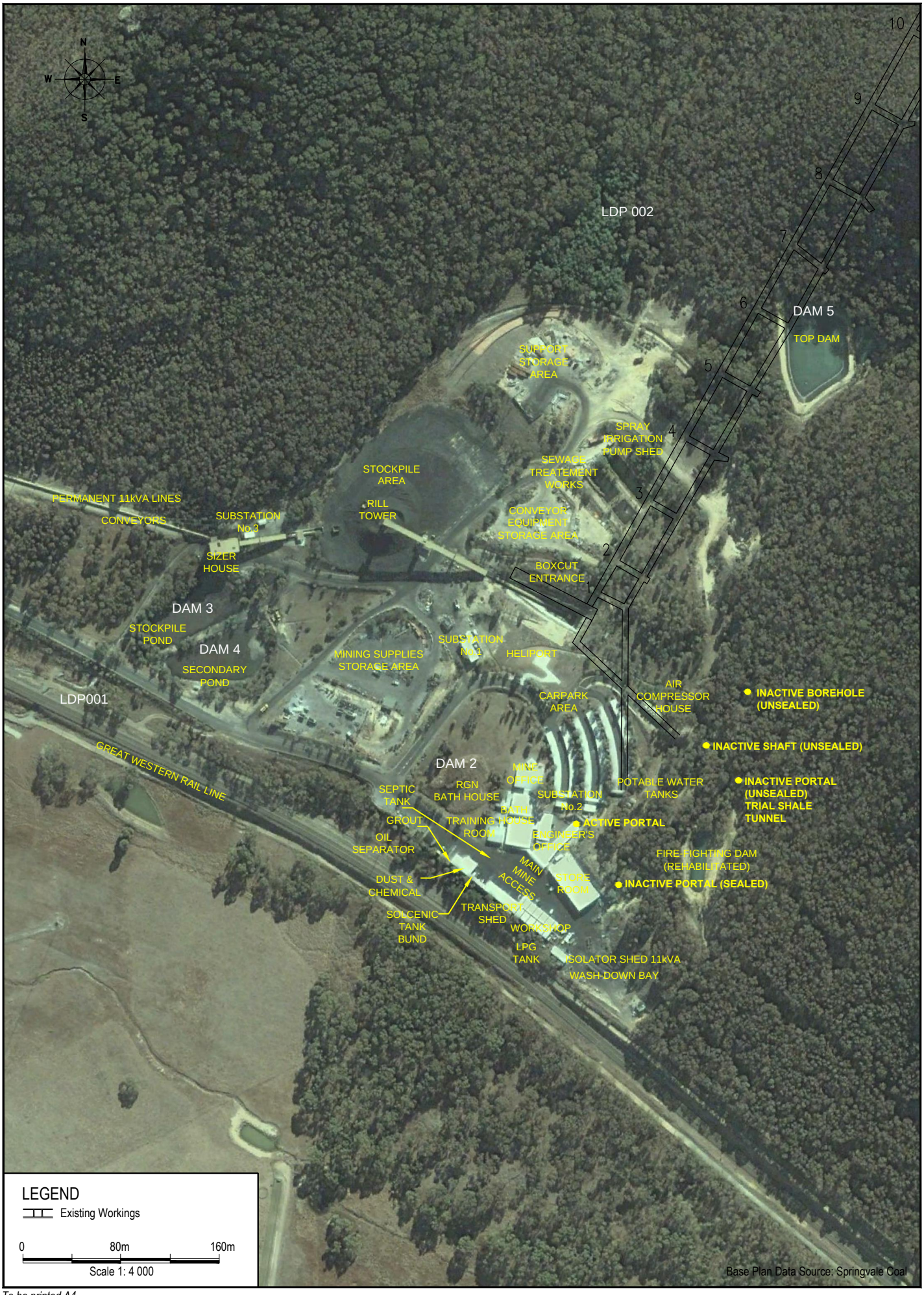
3.6.2 Springvale Coal Services Site

Springvale submitted an application in December 1992 to modify the original development consent of July 1992 to allow the use of the former Western Main Colliery CPP for the processing of Springvale's coal, rather than constructing a new CPP as per the original Environmental Impact Statement (Sinclair Knight, 1992). This modification was granted in 1993. The former Western Main Colliery is now referred to as Springvale Coal Services.

Existing surface facilities and associated infrastructure related to the Springvale Coal Services site are located over a broad area that extends from Springvale Pit Top area to Lidsdale Rail Siding and the CPP located on the Springvale Coal Services leases at Blackmans Flat. The Springvale Coal Services operation interfaces with the Springvale Pit Top at the point of delivery from the underground conveyor to the reinforced concrete Rill Tower.

Infrastructure located at the Springvale Coal Services includes the following:

- CPP;
- ROM and clean coal stockpile areas;
- Approved Reject Emplacement Area (REA) for the disposal of course reject from the CPP at the Huon REA and 'A Pit' REA, and a Co–disposal REA for both the fine and course reject materials;
- Conveyors and associated infrastructure;
- Settlement ponds located adjacent to the ROM Stockpile – These ponds capture the run off from the stockpile area prior to discharge from site via licensed discharge point LDP006 (refer **Section 3.8.1**);
- Dirty and clean water containment structures (refer **Section 3.8.5**);
- Electrical substations and transformer yards – This infrastructure consists of brick buildings with steel roofing located at various points along the conveyor, housing electrical control components and associated equipment;
- Main Control Room – The main control room houses the central control equipment, high voltage switchgear, motor control cubicles and ancillary equipment;
- CPP Switch Room – A brick and steel building located adjacent to the CPP houses the switch room containing high voltage switchgear, motor control cubicles and ancillary electrical equipment for the CPP;



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Pit Top Layout

FIGURE 5

V:\CCC15-005\Figures\Final\CAD\Fg5_CCC15-005_Pit Top Layout_120814.dwg

- Concrete water storage tanks (above ground) located adjacent to the CPP to provide water storage for use in the CPP and fire fighting purposes; and
- Administration infrastructure.

3.6.3 Remote Ancillary Infrastructure

Remote ancillary infrastructure associated with the operations at Springvale include dewatering infrastructure and water management infrastructure associated with the SDWTS, ventilation facilities, access roads, and power infrastructure supporting the surface facilities. Information on this existing infrastructure is provided below.

Surface Mine Dewatering Facilities

Since commencing operations in 1993, Springvale has drilled and operated a total of seven mine dewatering facilities within the Newnes State Forest on the Newnes Plateau. All dewatering facilities have been located at low points in the mine along the northern (downdip) perimeter of the workings.

These facilities include dewatering Bores 1 to 4 (all now decommissioned and rehabilitated) and the Bore 5 dewatering facility which included two boreholes with submersible pumps. Both boreholes at the Bore 5 facility are now decommissioned, but remain unsealed as a contingency should the re-installation of dewatering pumps at that location be required.

Springvale mine workings are currently dewatered using three submersible pumps at Bore 6. An in–seam pumping system is available at Ventilation Shaft 3 (in association with Springvale's ventilation shaft) for further dewatering of mine inflows, and is used as required. Both of these dewatering facilities are licensed as mining dewatering bores by the NSW Office of Water (10BL601863 and 10BL603519) and discharge into the SDWTS for delivery to the Wallerawang Power Station for use in the cooling towers.

SDWTS currently consists of a network of predominantly trenched pipes from Bore 6 and Ventilation Shaft 3 as illustrated in **Figure 4.** The 940 bore dewatering facility at Angus Place Colliery also feeds into the system (not shown).

Ventilation Facilities

Springvale is ventilated by two fans installed in parallel (one running and one on standby) at the top of the upcast Ventilation Shaft 3 facility. Shaft 3 is approximately 3.8 m in diameter and concrete lined, designed to provide a minimum of 4 m^3/s, per metre of extracted height, at the longwall face and 4.6 m^3/s at each continuous miner unit, in accordance with the *Coal Mines Health and Safety Act 2002*. The now redundant Ventilation Shafts 1 and 2 are used for air intake (refer **Figure 4**).

The Lithgow coal seam is extremely low in methane gas content, approximately 0.02%, and therefore no active management such as methane drainage is required. Methane monitoring in general mine ventilation gases is undertaken for mine safety reasons.

Access Roads

The sealed and regularly maintained access road to the Springvale Pit Top area is located off the Castlereagh Highway, approximately 1 km south of the village of Lidsdale.

Access to the Springvale Coal Services site is also from the Castlereagh Highway, within the village of Blackmans Flat. The unsealed access road is designed to a standard to allow for four–wheel drive and truck access, which is regularly maintained by contractors.

Access to exploration boreholes, ventilation shafts and dewatering sites in the Newnes State Forest is via public roads, which are predominantly unsealed and require four–wheel drive capability. Springvale has

a maintenance agreement with Forests NSW for the upkeep of these roads. An access agreement is also in place to use a private road owned by Delta Electricity to access Ventilation Shafts 1 and 2, which as noted above are now both used for mine air intake only.

Access along the overland conveyor route is via an unsealed corridor within mining leases MPL314 and ML1352, which overlies both Centennial and privately owned land.

Power Distribution to Surface Facilities

Power to the Pit Top area is supplied locally by an electrical network connection point at substation 0 (located at Lidsdale) equipped with 2 x 8 MVA, 66 kV/11 kV transformers (and via substations 1 to 3) which supply power to surface amenities, the underground conveyor system, and along with substation 4 (see below), supplies all Springvale's operational requirements.

Substation 4, located on Newnes Plateau, has 2 x 8 MVA, 66 kV/11 kV transformers, and supplies power to substation 5 located within the Ventilation Shaft 3 Facility on Newnes Plateau, approximately 2.8 km from substation 4, via 2 x 11 kV overhead aerials. Substation 5 supplies power to the main ventilation fan, air compressors, and is the main underground production and auxiliary supply.

Another 66 kV/11 kV 5 MVA substation (Bore substation) supplies the seam to surface bore pump infrastructure (three Springvale bore pumps at Bore 6 and one Angus Place Colliery bore pump). The power to Bores 1 to 5 was supplied by an overhead 11 kV aerial (refer **Figure 2**), while power to Bore 6 is supplied by a trenched underground cable from the Bore 5 location.

All powerlines and underground cables associated with Springvale's operations on the Newnes Plateau are regularly inspected at six monthly intervals by qualified contractors to ensure operational integrity. An annual bushfire inspection of the powerlines and cables is undertaken to ensure they do not impose any bushfire related threats. Pruning of branches in the vicinity of powerlines occur, if required.

The overland conveyor system is powered from separate supplies.

The CPP at Springvale Coal Services and all other conveyors are powered by an 11 kV feed from the Blackmans Flat Substation.

3.7 Coal Handling and Transport

3.7.1 Stockpiles

Springvale is serviced by an 85,000 tonne ROM stockpile at the Pit Top area. ROM coal extracted at Springvale is deposited on this stockpile by a conveyor linking the underground production areas to the surface. The coal is initially stockpiled by the reinforced concrete Rill Tower with a nominal capacity of 23,000 tonnes. During periods of peak production up to 85,000 tonnes can be stockpiled by using a dozer to spread the ROM coal.

In addition, a 600,000 tonne ROM/emergency stockpile area, and washed coal stockpile with a capacity of up to 150,000 tonnes, is available at the Springvale Coal Services site. A stockpile area, on land controlled by Centennial at Lidsdale Siding, is also used when exporting coal.

3.7.2 Coal Transport

Coal extracted from underground workings at Springvale is transported via conveyor to the coal Screening and Crusher Plant and ROM stockpile at the Pit Top area. The coal is then transported by overland conveyor to either Mt Piper Power Station, Wallerawang Power Station or to Springvale Coal Services for washing and export. No coal is transported from Springvale via road.

The main overland conveyor system consists of five conveyors and allows the delivery of coal to the Mt Piper power station at a rate of 900 tonnes per hour (tph). Ancillary conveyor systems enable coal to be diverted from this main conveyor system for delivery to Wallerawang Power station, or to the CPP at Springvale Coal Services for washing and export. A return conveyor takes the washed coal from the Springvale Coal Services site to Lidsdale Siding for rail transportation Port Kembla.

The overland conveyor system, which is illustrated in **Figure 4**, is approximately 11 km in length, of which 9.5 km is fully enclosed and the remaining 1.5 km partially enclosed. This conveyor system is inspected daily and maintained as required.

3.7.3 Coal Processing

Springvale's reclaim system at the Pit Top area has a nominal capacity of approximately 900 tph. ROM coal is reclaimed from the Rill Tower stockpile by two activators and two vibratory feeders. The coal is discharged from the reclaim conveyor to a sizing and scalping screen located within the steel frame fully clad Crushing and Screening Plant.

The 50 mm product is collected in the underpan of the first stage of the screen and deposited directly onto a conveyor and subsequently to the overland conveyor system without further processing. The coal product between 50 mm and 175 mm is separated on the second stage of the screen and is delivered on to another conveyor to the discharge chute above twin coal sizers. The sizers reduce this coal to a nominal 50 mm product for delivery to the overland conveyor system.

Crushed coal from the Crushing and Screening Plant is transferred to the CPP at Springvale Coal Services, via the overland conveyor system, to the ROM coal stockpile at the site, and subsequently reclaimed for transfer using a conveyor into a small surge bin. The surge bin feeds coal into the CPP at a rate of 300 tph. Coal processing and ash removal occurs via a system of jigs, spirals, and a dense/medium cyclone. Coal product from the CPP is transferred to a washed coal stockpile with a nominal capacity of 150,000 tonnes, and is subsequently transferred to Lidsdale Siding for export using the overland conveyor system.

3.8 Water Management

3.8.1 Overview

Water management at is undertaken in accordance with the Springvale Water Management Plan. The surface water management system at Springvale relies on the separation of clean and dirty water and the treatment of dirty water prior to discharge.

Water is discharged from Springvale through the following licensed discharge points included in EPL3607, the locations of which are illustrated on **Figure 4**:

- LDP001 – discharge from the Pit Top area;
- LDP002 – onsite discharge of treated sewage to the utilisation area;
- LDP004 – discharge on the Newnes Plateau from the SDWTS (under emergency circumstances only);
- LDP005 – discharge on the Newnes Plateau from the SDWTS (under emergency circumstances only);
- LDP006 – discharge from the Springvale Coal Services site;
- LDP007 – discharge from the overland conveyor route;

- LDP009 – discharge from the SDWTS bypass point east of Kerosene Vale Ash Dam; and
- LDP 10 – emergency/maintenance discharge from SDWTS upstream of settling ponds.

The EPA removed LDP003 from EPL 3607 in May 2000 due to the successful rehabilitation of the catchment area.

3.8.2 Water Supply and Use

Springvale utilises approximately 1.2 to 1.5 ML/day of mine water extracted from the underground workings, via the Pit Top extraction system described in **Section 3.8.3**, for a number of purposes including dust suppression (underground and surface), cooling of machinery (continuous miners, longwall machinery), and fire fighting supplies.

In addition to mine water, Springvale utilises potable water in the bathhouse and administration buildings, which is supplied via a pipeline by Lithgow City Council.

3.8.3 Underground Mine Water Management

The underground mine workings at Springvale are dewatered to ensure the safe operation of the mine. A small quantity of water extracted from the underground workings via the Pit Top collection system is used as process water, with surplus water discharged through LDP001 after aeration and settling in an 8 ML dam, identified as Dam 5 in **Figure 5**.

Extracted mine water from the current active borehole (Bore 6) and Ventilation Shaft 3 is also transferred directly to Wallerawang Power Station via the SDWTS, a system which was commissioned in March 2006. Bore 6 consists of three holes drilled and cased to below the Lithgow coal seam, and fitted with three pumps. Two of the pumps operate with variable frequency controllers and are capable of pumping at approximately 95 L/s; the third pump is capable of approximately 65 L/s. Bore 6 is connected by a 450 mm diameter polypipe into SDWTS. This pumping system currently has a maximum total capacity of 30 ML/day.

EPL3607 allows for emergency discharges through LDP004 and LDP005 on the Newnes Plateau, during pipeline failure or maintenance of SDWTS. It also allows for discharges from the scheme via LDP009 and LD010 as noted in **Section 3.8.1**.

An Emergency Holding Dam was constructed at the Ventilation Shaft 3 location in 2005, providing 5 ML of holding capacity to capture mine water in event of any shutdowns. The dam is also used for water storage available for use by bushfire fighting helicopters.

3.8.4 Springvale Pit Top Area Surface Water Management

The Pit Top surface water management system consists of separate clean and dirty water flow paths.

Clean water

Clean water diversion channels have been designed to capture clean runoff from undisturbed areas and discharge into Springvale Creek without contamination. Runoff from undisturbed areas is diverted away from operational areas and through the Springvale Creek discharge weir, which is a licensed discharge point (LDP001) under EPL 3607. The channels are protected by concrete mattresses and energy dissipaters, which have been installed at outlets of the main clean water channels. The channels were designed to handle a 1 in 100 year 24 hour storm event.

Surface runoff from the catchment behind the offices and car park area is collected in Dam 2 (refer **Figure 5**). This Dam provides primary settlement and is discharged as clean water through LDP001.

Dirty Water

As mentioned previously, water removed from the underground workings is stored in Dam 5 for reuse or discharge through LDP001 following treatment (refer **Figure 5**).

Storm water runoff from the Pit Top area passes through Dams 3 and 4. These dams are approximately 7 ML in capacity in total and are designed to handle a 1 in 100 year, 24 hour storm event.

Waste water from the machinery washdown bay, hardstand areas, oil storage areas, and maintenance and service workshop, along with stormwater runoff from the workshop areas, is collected in a common wastewater collection drain which gravity feeds to an oil/water separator unit. The separator is designed to accommodate a 1 in 5 year storm event, based on the first flush principle, without overflow. Oil and grease from the separator is disposed off–site by a licenced contractor, while the separated water enters the dirty water system via Dam 3 and Dam 4.

Dam 3 and Dam 4 also receive dirty water runoff and washdown water from the permanent coal stockpile and Crushing and Screening Plant areas. The water from Dam 3 cascades into Dam 4 where it settles further before being pumped underground for reuse in mining operations. Dam 3 is normally kept at a very low level to ensure maximum capacity is available to capture runoff in a storm event.

Fines collected in the overland conveyor sump are removed by pumping onto the overland conveyor. Overflow of this sump is discharged through LDP007.

3.8.5 Springvale Coal Services Site Water Management

The Springvale Coal Services site currently has an established water management system incorporating clean and dirty water systems. Dirty water collected around the site is directed through diversion channels into the main dirty water containment structures. These include a series of dams and weirs leading to the main pollution control structures near the front entrance to the site. The main structures consist of sediment retention dams (DML Dam, Cooks Dam, Retention Pond) which are designed to retain runoff from a 1 in 100 year 24 hour storm event.

Water from the dams is either recycled for process water or discharged through LDP006 (refer **Figure 4**). Prior to discharge through LDP006, a series of rock weir structures slow the water flow and increase the residency time to allow greater settlement. Water discharged through LDP006 is monitored monthly in accordance with EPL3607.

3.8.6 Sewage Treatment System

Sewage and grey water from the bathhouse and offices at the Pit Top area is treated on site in a sewage treatment facility, at the location marked in **Figure 5**. The sewage treatment system at Springvale consists of a macerator pump pit (where sewage and grey water gravitate from the bathhouse and offices), which pumps to an oxidation pond and then to a maturation pond. The treated effluent is then pumped via LDP002 to a sprinkler system in a 4 hectare onsite utilisation area. The sprinklers are in four separate zones which are alternated to ensure full utilisation and to eliminate run off from the utilisation area.

3.9 Waste Management

3.9.1 Coarse Rejects

Coal reject is produced by the preparation of product coal in the CPP at the Springvale Coal Services site, and consists of high ash coal and non–coal material such as other sedimentary rock, which occurs within the extracted raw coal. Coarse reject material is transported via haul trucks to the Huon No. 6 REA or the ‘A Pit’ REA. It may also be used as part of general operations or made available for other projects.

3.9.2 Fine Rejects

Fine coal reject from the CPP is fed to the Co–disposal dam via slurry pipes. Decant pipes are positioned to collect pooled water after settling of the fine material. The water is discharged to the retention dam below the co–disposal unit for either reuse in the CPP as clarified process water or disposed off site under licence conditions. The area is designed to contain 382,000 m^3 of material and is fully bunded to contain reject material. The fines may be dried and blended into product coal for both domestic and export markets.

3.9.3 General Waste

General waste produced as a by–product of the operations at Springvale is disposed of to a landfill by licensed waste contractors.

Waste oil collected in the workshop is stored in an underground collection sump before being removed off site by a licenced contractor for recycling.

Separate bins for paper and cardboard, oily rags, oil and diesel filters, expired chemical anchors and poly pipe are in use at Springvale, with waste oil is recycled by a renewable oil service.

3.10 Progressive Rehabilitation

Due to the underground nature of mining operations at Springvale, surface disturbance and the need for progressive rehabilitation is relatively minor compared to that required at an open cut mining operation. However, Springvale does adopt a progressive approach to rehabilitation as mining progresses where possible. This generally relates to the progressive rehabilitation of surface infrastructure such as dewatering facilities that are no longer required to support mining activities. Rehabilitation activities also include on–going maintenance of previously rehabilitated areas.

3.11 Post Mining Closure and Rehabilitation

The current approved MOP includes a Final Rehabilitation Plan (MOP Plan 6) for Springvale, which shows the proposed rehabilitation of the site. The final landform of the Pit Top and conveyor route will be stable, aesthetically consistent with the surrounding landforms and will not preclude alternative land uses following the completion of all mining activities on site. Surface contours have not generally been significantly altered from pre–mining conditions to accommodate the majority of the infrastructure at Springvale and in the Newnes State Forest. This has reduced the impact on the existing contours and grades, and therefore significant earthworks will not generally be required to return the landform to pre–mining levels.

It is anticipated that the final land use for the Pit Top will be grazing and/or rehabilitated to its original open forest landscape. The Pit Top area including the buildings, workshops, water dams, settling ponds, substations and parking areas will be decommissioned and rehabilitated on completion of mining activities.

The main services on the Newnes Plateau, including dewatering bores, substations, access roads and Ventilation Shaft 3 will be decommissioned and rehabilitated as soon as practicable following the end of production. In addition, dewatering will be progressively rehabilitated at the end of production, or as soon as they are no longer required.

The majority of the Ventilation Shaft 3 area will be returned to pre–mining contours and native vegetation in agreement with Forests NSW, while the Emergency Holding Dam area may be retained for use by Forests NSW for fire fighting purposes. Electrical substations and powerlines will also be rehabilitated to the appropriate standard as agreed between Springvale and Forests NSW.

The final land use of the overland conveyor route will be determined upon assessment of the future demand for this facility at the time of decommissioning, as the design life of the Mt Piper Power Station is

longer than the anticipated life of Springvale. The overland conveyor will be decommissioned and rehabilitated, generally to original contours once no longer required.

The Springvale Coal Services site will be rehabilitated following completion of mining, with a final land use of native forest ecosystem similar to that immediately surrounding the site. The area to the north at the site will be required by Delta Electricity for an additional ash emplacement area, and to accommodate the Lithgow City Council Waste Emplacement Facility.

3.12 Environmental Management and Monitoring

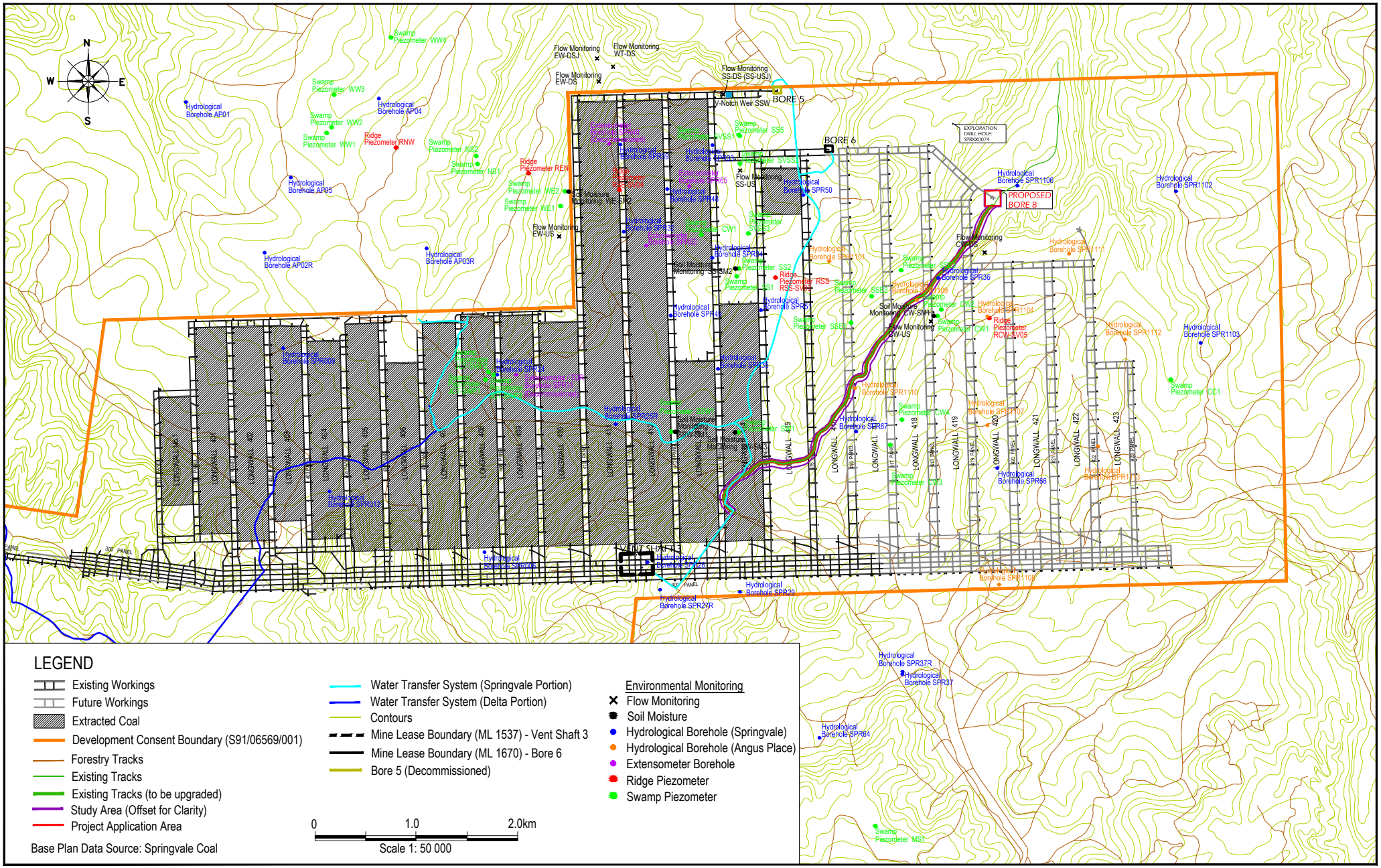
Springvale has an established Environmental Management System (EMS) that has been developed in accordance with the Centennial EMS Framework. The EMS has been developed to be generally consistent with the elements of ISO 14001 and provides an environmental management framework for all activities and areas managed by Springvale.

As part of this EMS, a comprehensive set of environmental management plans have been developed and implemented at Springvale.

The existing environmental management plans include:

- Bushfire Procedure;
- Subsidence Community Consultation Process;
- Subsidence Management Plan;
- Infrastructure Management Plan;
- Subsidence Management and Reporting Program;
- Public Safety Management Plan;
- Land Management Plan;
- Newnes Plateau Shrub Swamp Management Plan;
- Surface Water Management Plan;
- Waste Management Plan;
- Air Quality Management Plan;
- Noise Management Plan;
- Environmental Monitoring Program;
- Erosion and Sediment Control Procedure;
- Ventilation Management System;
- Strata Failure Management System; and
- Road Management Plan.

The environmental management plans are backed by an environmental monitoring network, which includes monitoring of noise, dust, surface water discharge and subsidence. The various monitoring sites are identified on **Figure 6**. Results are reported monthly on the Centennial (Springvale) web page, quarterly in the subsidence management status reports, annually in the Annual Environmental Management Report (AEMR) and in the longwall end of panel reports.



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Environmental Monitoring Locations

FIGURE 6

V:\CCC15-005\Figures\Final\CAD\Fg6_CCC15-005_Environmental Monitoring Sites_120815_2.dwg

4.0 PROPOSED MODIFICATION

4.1 Overview

Springvale seeks to modify development consent S91/06569/001 to allow for the construction and operation of an additional surface mine dewatering facility (Bore 8) within the Newnes State Forest on the Newnes Plateau.

Bore 8 is required to facilitate the progress of coal extraction further to the east of existing workings at Springvale, and need to be established ahead of the workings to ensure water levels are kept at safe and manageable levels. The bore will form a critical part of Springvale's existing dewatering system as longwall mining progresses through LW416 to LW419. Water pumped out of the underground workings at Bore 8 will be sent via pipelines to Wallerawang Power Station, as part of the existing SDWTS.

Establishment of an access track and ancillary infrastructure corridor to Bore 8 totalling approximately 3.5 km in length and 10 m wide will also be required, utilising an existing track. 11 kV cables and water transfer pipelines will be buried in the infrastructure corridor alongside the access track within this 10 m wide corridor.

Current mine scheduling indicates that Bore 8 will be required in mid–2013 to facilitate safe mining activities within LW416 to LW419. Construction of Bore 8 and associated infrastructure would therefore need to commence by December 2012.

Table 6 provides an overview of the proposed modification, summarising and comparing the major components of the existing operations at Springvale approved under S91/06569/001 as modified, and the proposed modification.

Table 6 – Key Features of the Modification and Comparison with Existing Operations

Aspect	Description of Existing Operations	Proposed Change
Newnes Plateau Mine Services	Bore 6 dewatering facility, consisting of three boreholes installed with submersible pumps. Ventilation shaft complex (Ventilation Shaft 3), consisting of a pumping system. Bore 5 dewatering facility (decommissioned, however bores remain unsealed as a contingency). Services boreholes located at the Ventilation Shaft 3 complex. Overhead powerlines and underground cables. Access tracks and fire trails.	An additional dewatering facility, referred to as Bore 8, involving the following components. • Augmentation and upgrade of an existing access track to Bore 8. • New pipeline to connect Bore 8 to the existing DWTS. The pipeline will be buried adjacent to the access track. • 11 kV underground power cable to be buried in a common trench with the water pipelines adjacent to the access track.
Mine dewatering	Springvale is currently dewatered using Bore 6, bores at Ventilation Shaft 3 and the Pit Top collection system. Mine water collected within the Pit Top Collection System is reused as process water, with the balance either transferred to Wallerawang Power Station via the DWTS, or discharged to the Coxs River through LDP001 and on the Newnes Plateau via LDP004/5 (in an emergency only) in accordance with EPL3607. The SDWTS has a design capacity of 30 ML per day.	One new dewatering facility to be installed (referred to as Bore 8). New pipeline to connect to the existing DWTS, to be buried adjacent to the access track. No other changes are proposed to the SDWTS with the water make from Bore 8 predicted to be well within its design capacity of 30 ML/day.

Aspect	Description of Existing Operations	Proposed Change
Production	Springvale is approved to produce up to 3.4 Mtpa of ROM coal.	No change.
Mine Life	Development Consent S91/06569/001 limited to 21 years from granting of Coal Lease (ML1326), expiry 28 September 2014.	No change.
ROM Stockpile	Current stockpile capacity at the Pit Top is 85,000 t	No change.
Coal Preparation	Coal is crushed at the on–site screening and Crushing and Screening Plant.	No change.
Land Preparation	As Springvale is an established underground mine, minimal land preparation occurs. Minor land preparation is occasionally required for exploration purposes and the installation of support infrastructure.	Land clearance will be required for the drill pad and supporting ancillary infrastructure at Bore 8. An existing access track will be augmented and upgraded. In total, approximately 4 ha will be disturbed; however 2.34 ha will be partly rehabilitated.
Product Coal Transport	Coal is transferred on to overland conveyors and transported to either Mount Piper or Wallerawang power stations, or to the Springvale Coal Services Site for washing and export.	No change.
Waste Management	Coarse reject material from the CPP at the Springvale Coal Services site is transported via truck to the Huon REA and 'A Pit" REA, also at the site. Fine coal reject from the coal preparation plant is fed to the Co–disposal REA via slurry pipes.	No change.
Surface Water Management	The surface water management system at Springvale relies on the separation of clean and dirty water and the treatment of dirty water prior to discharge through LDP001. Current water management occurs in accordance with the site water management plan.	No change proposed to the surface water management system, which will continue to utilise the existing Springvale infrastructure at the Pit Top. No changes to current discharges to the Coxs River. No change proposed to the EPL in relation to surface water management.
Rehabilitation	Given that Springvale is as an underground coal mine, rehabilitation is currently limited to small areas in the Newnes State Forest following the cessation of exploration activities, or when surface infrastructure is decommissioned.	Complete rehabilitation of Bore 5, including sealing of bores in accordance with DRE requirements. Partial rehabilitation of Bore 6 facilities. Bores to remain unsealed as a contingency. Partial rehabilitation of the services corridor to Bore 8 following construction and commissioning. Full rehabilitation of Bores 6 and 8 and ancillary infrastructure corridors following eventual facility decommissioning.

The proposed modification is described in more detail in the sections below to provide an overall understanding of the nature and extent of the works proposed.

4.2 Proposed Infrastructure

Bore 8 will be constructed as per the existing dewatering facility at Bore 6. The mechanical and electrical requirements for Bore 8 are the same as Bore 6 with one exception; Bore 8 will contain four submersible pumps as opposed to the three currently at Bore 6.

Existing infrastructure at Bore 6 can be seen in **Plate 1**. Two of the three boreholes at Bore 6 are shown, as well as the switchroom with power control equipment which can be seen in the background.

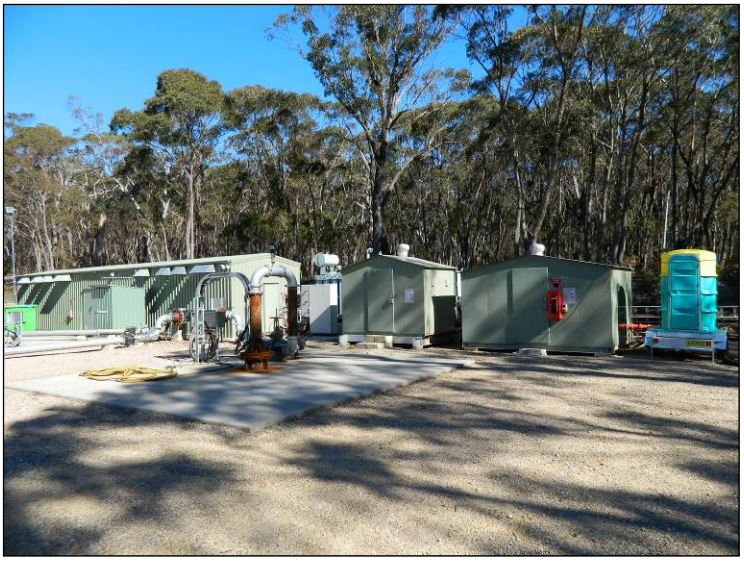
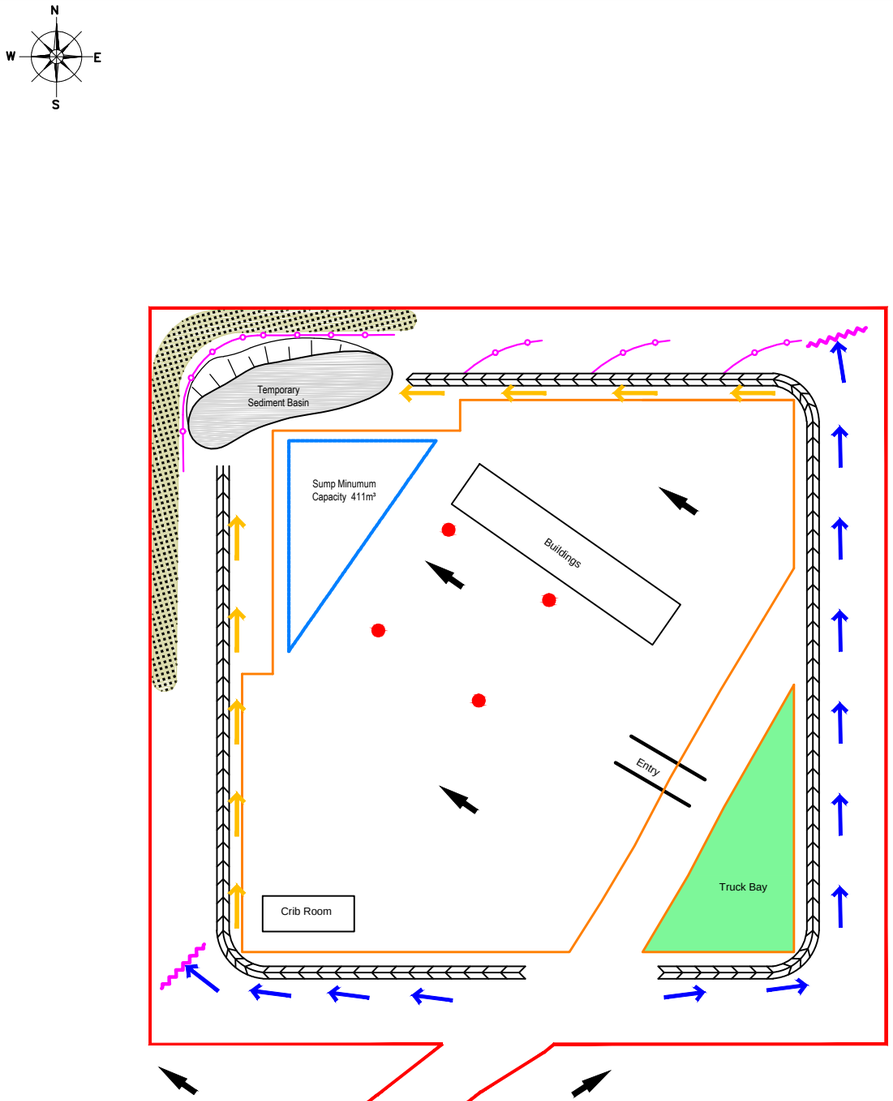


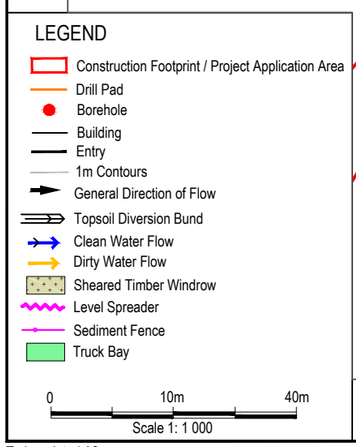
Plate 1 – Bore 6 Dewatering Facility

Establishment of the dewatering facility at the Bore 8 drill pad area will include the following:

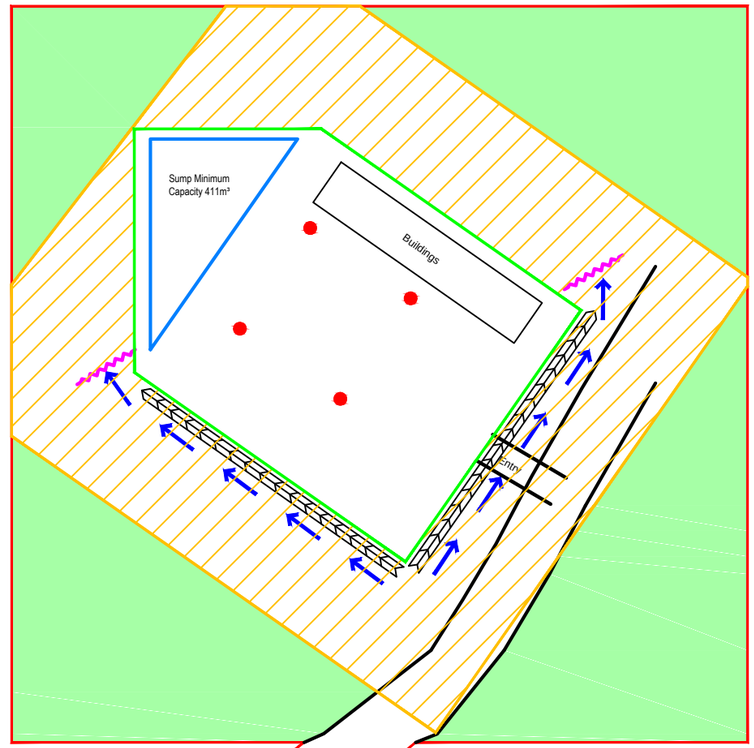
- Construction of four dewatering boreholes, each with a submersible pump;
- Two 11 kV to 3.3 kV transformers;
- One high voltage switchroom;
- Two variable voltage variable frequency (VVVF) and two soft starters; and
- Fencing around the facility.

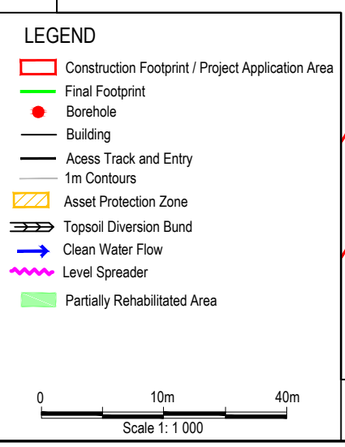
The borehole specification is provided in **Table 7**, and indicative site layouts for the construction and operational phases are illustrated on **Figure 7**. Diesel generators may be installed at the Bore 8 facility as a short–term contingency for power outage, in particular when a new longwall commences at the northern most extent of the mine plan when there is no capacity underground to store water. The diesel tank for the generators will be bunded to contain any accidental hydrocarbon spill.





Bore 8 Indicative Construction Phase Layout





Bore 8 Indicative Operational Phase Layout

Base Plan Data Source: Springvale Coal

To be printed A3

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

V:\CCC15-005\Figures\Final\CAD\Fg7_CCC15-005_ Bore 8 Indicative Layout_120911.dwg

Springvale Colliery
Bore 8 Indicative Layout

FIGURE 7

Table 7 – Borehole Specification

Item	Specification
Number of dewatering bores	Four
Hole Depth	470 m
Hole Diameter	22 inch
Collar Casing	The collar of each hole is to be cased to the satisfaction of Springvale
Downhole Casing	Each hole is to be cased in its entirety with 18 inch O.D. steel pipe as follows: 0–410 m, 10.3 mm casing 410–470 m, 12.7 mm casing
Pressure Cementing	Casing to hole wall annulus to be pressure cemented over the full length of each hole
Hole deviation	Less than 12 m from target

Establishment of Bore 8 Drill Pad Area and Access Track

The final footprint of the Bore 8 facility will be 0.32 ha within a 120 m x 120 m surveyed area. However, a drill pad of approximately 0.77 ha in area (included within the Project Application Area, as defined in **Section 1** and in **Figure 7**) will initially need to be cleared of vegetation and the area graded to form a level pad for construction of the boreholes. This drill pad footprint will allow for the movement of heavy vehicles within the construction area and the installation of a sump to contain drilling fluids, as well as the storage of all required equipment and spares within the dewatering facility compound. In addition, surface water management structures will be installed around the drill pad, leading to a total disturbance associated with the drill pad of approximately 1.44 ha.

Upon completion of construction and commissioning of the boreholes, the area will be partially rehabilitated, leaving a semi–permanent footprint of 0.32 ha comprising the proposed four boreholes and associated infrastructure, and the sump, which will remain and be maintained for the duration of the operation of Bore 8. This cleared area is required in the event of pump failure, where removal of pumps requires access for a slewing crane and a number of heavy plant units. A man–proof security fence will also be constructed around the perimeter of the final footprint.

In addition to the semi–permanent final footprint which will remain completely cleared for the duration of operation of Bore 8, an APZ will be established around Bore 8. This APZ is illustrated in **Figure 7**, and will be re-vegetated for erosion and sediment control purposes; however the vegetation will be managed so as to reduce the fuel load. Further information on the APZ is provided in **Section 7.3**.

An access track and ancillary infrastructure corridor to Bore 8 totalling approximately 3.5 km in length and 10 m wide will also be established, utilising an existing track. 11 kV cables and water transfer pipelines will be buried in the infrastructure corridor alongside the access track within this 10 m wide corridor, discussed in detail below). Vegetation clearing will be required for the proposed upgrade works on the existing track. However, partial rehabilitation to reduce the final width of the track to approximately 5 m width will be undertaken.

In summary, the Project will require clearing of vegetation (both full and partial) within the drill pad and access track areas (approximately 4 ha), however, approximately 2.3 ha of the cleared area will be partially rehabilitated upon completion of construction activities.

Ancillary infrastructure

Operation of Bore 8 requires the installation of an 11 kV underground cable, as well as the water pipeline to transfer water away from the bore and feed into the SDWTS. Both the power cable and the water pipeline will be buried in a common trench which will follow, as far as practically possible, the existing access track within a 10 m infrastructure corridor.

Installation of the trenched cable to Bore 8 is proposed to occur at the intersection of Sunnyside Ridge Road and the 66 kV powerline easement (refer **Figure 2**). It is proposed to supply power to Bore 8 from the existing Springvale 11 kV aerial connection at this location, which is approximately midway between Springvale's substation 4 and Ventilation Shaft 3 (refer **Section 3.6.3**). A pole mounted circuit breaker and air–break switch will be installed at the location to establish power supply to Bore 8. This 11 kV cable will be trenched underground from this location for approximately 3.5 km to the Bore 8 location.

The pipeline from the Bore 8 location will be connected to the existing SDWTS pipeline to Bore 6 at the location marked on **Figure 2**, approximately 500 m along Sunnyside Ridge Road adjacent to Maiyigu Marragu Trail (formerly Blackfellows Hands Road), using appropriate connectors. The pipeline will be trenched underground adjacent to the existing track to the proposed Bore 8 location along with the 11 kV cable.

The placement of the cable and pipeline utilities underground reduces the visual impacts of the infrastructure and avoids risk from bushfire, whilst also making the installation of this infrastructure less susceptible to tampering.

4.3 Drilling method

The blind boring method will be used to construct the four boreholes at the Bore 8 facility. This process, as described in the Hydrogeological Impact Assessment (Aurecon, 2012), involves drilling a pilot hole followed by boring with a blind boring head, to produce a borehole of the desired diameter. Drilling mud with a controlled density is fed into the void above the cutting head to lubricate cutting and balance the hydrostatic pore fluid pressure. Cuttings report to the surface where they are excavated from the process ponds and piled up. On completion of boring, the head is removed on the surface, and the borehole liner with a capped bottom is lowered down the hole, displacing the drilling mud. Finally the annulus between the liner and borehole is grouted.

4.4 Location

As illustrated on **Figure 2**, Bore 8 is to be located northeast of LW419 and north of LW420. The proposed location of Bore 8 has been chosen to suit anticipated seam floor contours and the mine layout as described in the paragraph below, together with suitable topography for the location of the associated surface infrastructure.

A seam roll (or ‘syncline’) is present towards the northern extent of the Springvale Mine Lease ML1326. This syncline has previously been intersected by LW411 to LW413, and is currently predicted to continue along strike in an east–west direction. The syncline intersected the workings at around 30 cut through in these longwall panels and gateroads and generates a change in seam floor relative level (RL) of greater than 8 m, and therefore forms the lowest point in the seam. As can be seen on **Figure 2**, LW414 to LW418 were therefore reduced to their northern extent in part to remove the requirement to produce through this syncline where water volumes would become unmanageable, severely affecting the mines ability to produce safely and efficiently. Due to the large volume of water which currently reports into the mine workings (approximately 190 L/s) and the significant change in the RL of the seam floor, there is the potential for the workings to become flooded in the event of a pumping system failure. This would result in those areas surrounding the syncline trough and inbye areas becoming inaccessible, resulting in a safety hazard for Springvale’s workforce, and business, as Springvale does not have the capacity to deal with this volume of water in–pit.

The location of Bore 8 was therefore chosen based on current seam floor RL knowledge so that water will gravitate towards the collection point due to the northwest–southeast dip direction, and preferential floor contours. The ability of the water to report to this location without the need for complicated pumping systems allows Springvale to reduce the risk to its workforce and infrastructure, whilst reducing the potential impact of electrical pumping system failure.

An alternative location was investigated for the additional dewatering facility, and this is described further in **Section 9**.

4.5 Surface Tenure

Bore 8 will be constructed within the Newnes State Forest, and while Springvale holds ML1326 and ML1588 beneath the proposed bore location, neither of these confer surface tenure. The sites of previous mine dewatering facilities at Springvale have been secured through an initial Occupation Permit 2349 with Forests NSW and subsequently through a Mining Lease (ML 1670 for the Bore 6 facility and ML 1537 for Ventilation Shaft 3 facility).

Springvale will apply to Forests NSW for a variation to Occupation Permit 2349 to include the infrastructure associated with Bore 8. However it is noted that native title has not been extinguished over the Crown Land in the Project Application Area. Springvale will need to comply with the applicable requirements of the *Native Title Act 1993* before obtaining the necessary mining lease for Bore 8, as discussed in **Section 5.2.3.**

4.6 Access

Access to Bore 8 will be via Sunnyside Ridge Road in the Newnes State Forest, utilising a previously well established and frequented track striking NNE–SSW, as shown on **Figure 2** and illustrated in **Plate 2**.

Plate 2 – Existing track to be upgraded to Bore 8

The existing access track will require augmentation and upgrading to allow safe, all weather access for large construction and maintenance equipment to Bore 8. This will involve widening the track to approximately 5 m in width, from the current width of approximately 3.5 m.

In addition, as described in **Section 4.2.1**, the power cable and water pipelines will be buried alongside this access track in an ancillary infrastructure corridor also approximately 5 m in width, resulting in a combined access track and infrastructure corridor of around 10 m in width. However, once installed, the infrastructure corridor will be rehabilitated and seeded with endemic species, leaving a 5 m wide track.

4.7 Construction Activities

Construction of Bore 8 will be undertaken in a number of stages:

1. Installation of erosion and sediment controls along the access track and around the drill pad (described further in **Section 7.11**) including a sediment basin downslope of the proposed sump and borehole locations within the drill pad (refer **Figure 7**);

2. Clearing and widening of the existing access track to Bore 8 location, involving the augmentation and upgrade of the existing track to approximately 10 m width;

3. Installation of utilities (underground power cable and water pipeline) along access track to Bore 8 with progressive rehabilitation of the access track to a final width of approximately 5 m;

4. Clearing of drill pad – initially a pad of 0.77 ha will be cleared to allow for sufficient room for construction activities;

5. Installation of temporary fencing around the construction footprint;

6. Drilling of boreholes following construction of the sump downslope of the borehole locations;

7. Installation and commissioning of submersible pumps;

8. Construction of a number of low rise buildings to house a VVVF control room, soft starter control room and an 11 kV switch room;

9. Part rehabilitation of the construction footprint upon completion of construction works to reduce the footprint of the drill pad disturbance area to a final footprint of 0.32 ha for the operation pad area; and

10. Installation of a permanent fence and lockable access gate around the perimeter of the facility, including the sump area.

Construction Equipment

To construct and commission Bore 8, plant and equipment will include, but is not limited to, the following:

- Multi–purpose large diameter drill rig (Bourne 2000 or similar) that is capable of down hole hammer;
- Semco S3000 for grouting and pilot holes;
- Semi–trailers;
- Water carts;
- All terrain forklift;
- Four air compressors;
- Cranes;

- Two mud pumps; and
- Four–wheel drive support vehicles.

Waste Management

A sump will be constructed within the construction footprint at Bore 8 to contain drilling fluids during drilling of the boreholes. A review of sump designs utilised at the Bore 6 facility was undertaken by Aurecon in 2010, which resulted in Springvale adopting the Aurecon design standard, which requires sumps to be larger than previously utilised at Bore 6. For the Bore 8 facility a sump of 411 m^3 will be constructed, and this larger sump capacity will have the effect of reducing the number of vehicle movements in terms of carting water to and from Bore 8 during construction works. This sump will remain as part of the Bore 8 facility until the facility is decommissioned and rehabilitated, at which time it will be rehabilitated.

4.8 Timing

Depending on weather conditions and construction/commissioning constraints, it is expected that it will take approximately one month to set up the drill pad, three months to construct and two months to commission Bore 8, totalling an anticipated six month construction/ commissioning period.

The construction of Bore 8 is expected to commence in early 2013, with completion by mid–2013.

4.9 Operating Hours and Personnel

Approximately 10 people will be present on site each day during construction and commissioning. In periods of high activity such as during crane operation and concrete truck deliveries, this number may be exceeded. The personnel involved are anticipated to be contractors and Springvale will oversee the construction and commissioning of the facility. No additional employment will be required at Springvale.

Drilling operations will be conducted seven days a week, 24 hours a day to complete Bore 8 within the anticipated timeframe.

On the completion of commissioning, the Bore 8 will be fully automated with scheduled servicing as required.

4.10 Transport and Traffic Movements

Heavy vehicles will access Bore 8 via the Old Bells Line of Road at the Zig Zag Railway located in Clarence. It is proposed that light vehicles will access Bore 8 by either the Old Bells Line of Road from Clarence or via the State Mine Gully Road from Lithgow. Both routes converge with final access to the site off Sunnyside Ridge Road in the Newnes State Forest.

During the construction and commissioning stage it is estimated that approximately four heavy vehicles and four light vehicles will travel to Bore 8 each day. Once operational, traffic movements associated with Bore 8 will be minimal, with the occasional light vehicle trip required for maintenance and inspection purposes. In addition, in the event that backup power supply is required at the dewatering facility, diesel generators may be brought to Bore 8, resulting in some additional occasional vehicle movements to the Bore. Inspections will be carried out in accordance with the approved Springvale Infrastructure Management Plan, which will be updated to incorporate the proposed modification if approved.

4.11 Decommissioning and Rehabilitation

Bore 8 will be a semi–permanent feature in the landscape until the infrastructure is no longer required and decommissioned. Following decommissioning, full rehabilitation will be undertaken in accordance with the Occupation Permit, and to the landowner's standard and satisfaction. All infrastructure will be removed, and the four dewatering bores sealed. This has previously been successfully undertaken for Bores 1 to 4 at Springvale, with the same procedures to be followed for Bore 8. Further detail on decommissioning and rehabilitation is provided in **Section 7.11**.

As described above in **Section 4.2.1**, Bore 5 has been decommissioned and partially rehabilitated. Bore 6 may be utilised during the commissioning of Bore 8. However following the commissioning of Bore 8, Bore 5 will be fully rehabilitated on agreement with the landowner. Bore 6 will be decommissioned; however will remain unsealed, similar to Bore 5, and will serve as a contingency in Springvale's underground dewatering system.

No change is proposed to the existing mine closure and rehabilitation described in **Section 3**. The final landform of the Pit Top and conveyor route will be stable, aesthetically consistent with the surrounding landforms and will not preclude alternative land uses following the completion of all mining activities on site. Further details of the rehabilitation works that will be undertaken are given in **Section 7.12**.

4.12 Environmental Management and Monitoring

The environmental management plans and monitoring programs currently in place at Springvale will be reviewed and updated, as required, to incorporate the Project commitments made in this EA and any additional consent conditions.

The results of the various environmental monitoring activities will continue to be reported internally on a monthly basis and externally on an annual basis in the AEMR.

5.0 REGULATORY FRAMEWORK

The proposed modification has been assessed in full consideration of the applicable statutory planning instruments of the Commonwealth and State. The following sub–sections provide a summary of the relevant key pieces of legislation and outline the application of these to the Project.

5.1 Approval Pathway

Development consent S91/06569/001 in respect of development application 11/92 (DA 11/92) was granted to Springvale Coal by the then Minister for Planning on 27 July 1992 under Section 101 of Part 4 of the EP&A Act. Springvale Coal now seeks a modification to S91/06569/001 pursuant to the provisions of Section 75W of the EP&A Act to allow for an additional mine dewatering facility.

Part 3A of the EP&A Act was repealed and a new assessment system for projects of State significance commenced in NSW on 1 October 2011. However, Schedule 6A of the EP&A Act contains savings and transitional arrangements. Specifically, Clause 12 of Schedule 6A advises that Section 75W of Part 3A continues to apply to modifications of the development consents referred to in Clause 8J(8) of the EP&A Regulation.

Clause 8J(8) of the EP&A Regulation provides a mechanism whereby major projects approved under Part 4 of the EP&A Act can be modified under Section 75W, stating that:

> *(8) For the purposes only of modification, the following development consents are taken to be approvals under Part 3A of the Act and section 75W of the Act applies to any modification of such a consent:*
>
> *(a) a development consent granted by the Minister under section 100A or 101 of the Act,*
>
> *(b) a development consent granted by the Minister under State Environmental Planning Policy No 34 – Major Employment–Generating Industrial Development,*
>
> *(c) a development consent granted by the Minister under Part 4 of the Act (relating to State significant development) before 1 August 2005 or under clause 89 of Schedule 6 to the Act,*
>
> *(d) a development consent granted by the Land and Environment Court, if the original consent authority was the Minister and the consent was of a kind referred to in paragraph (c).*
>
> *The development consent, if so modified, does not become an approval under Part 3A of the Act.*

As advised above, S91/06569/001 was originally granted by the Minister under Section 101 of Part 4 of the EP&A Act and accordingly, under Clause 12 of Schedule 6A of the EP&A Act, Section 75W is the approval pathway for the proposed modification.

Development consent S91/06569/001, if modified, will not become an approval under Part 3A, but will remain a development consent under Part 4.

This approval pathway was confirmed by the DP&I in an email dated 21 December 2011, a copy of which is included in **Appendix E**.

5.1.1 Director General's Requirements

A meeting was held on 21 November 2011 between Centennial and the DP&I to discuss various upcoming Centennial projects, including the proposed modification at Springvale. The issue of whether Director–General Requirements (DGRs) were to be issued for the Project was discussed at this meeting, and that they may not be required due to the scale and nature of the Project.

Following this meeting, an email was sent to the DP&I on 10 December 2011 from Centennial seeking to confirm both the approval pathway for the Project, and that DGRs were not required. A response was

received on the 21 December 2011 from the Department, confirming DGRs would not be issued for the Project, and that the EA should be prepared in accordance with the assessment considerations put forward by Springvale in the email on 10 December 2011, and reproduced in **Table 8**.

The Project description originally put forward to the DP&I in December 2011 involved not just Bore 8, but the installation of two dewatering facilities (Bores 7 and 8), as well as an increase in annual ROM coal production. **Table 8** therefore includes environmental considerations associated with this larger Project scope. However, during the process of preparation of the EA and further refinement of the Project description, the decision was made by Springvale to not proceed with seeking approval for Bore 7 or the increase in annual ROM production. Further details on these alternatives considered in the Project are provided in **Section 9**.

Table 8 – Environmental Assessment Considerations presented to the DP&I

Key Feature	Proposed Change	Environmental Assessment Considerations	Comment/ Where addressed in EA
Newnes Plateau Mine Services	Two additional dewatering facilities known as Bore 7 and Bore 8 Augmentation and upgrade of exiting access track and fire trails New pipelines to tee into the existing SDWTS to be buried adjacent to existing access tracks 11kV power cable to be buried in a common trench with the pipelines adjacent to existing access tracks	• Groundwater assessment to investigate potential impacts resulting from water make and determine whether those impacts are acceptable or can be mitigated. Measures to manage water make also need to be confirmed. • Erosion and sediment assessment. • Flora and fauna, archaeological, air quality assessments (see land preparation section). • Noise assessment to consider impacts from construction and operation of the installation(s). • Visual impact assessment to consider impact of buildings and infrastructure on surrounding environment. • Traffic impact assessment to consider the impacts resulting from both the construction and operational phases with respect to the existing infrastructure. • Bushfire risk assessment • Greenhouse assessment to model impacts arising from operation of the new facilities • Waste management	Approval is no longer sought for Bore 7 therefore the following sections address Bore 8 only. • Groundwater assessment – **Section 7.2** • Erosion and sediment – **Section 7.11** • Flora and fauna – **Section 7.4**, Aboriginal and European Heritage – **Section 7.6**, Air Quality – **Section 7.7** • Noise assessment – **Section 7.5** • Visual assessment – **Section 7.13** • Traffic assessment – **Section 7.10** • Bushfire assessment – **Section 7.3** • Air quality and GHG assessment – **Section 7.7** • Waste Management – **Section 7.8**

Key Feature	Proposed Change	Environmental Assessment Considerations	Comment/ Where addressed in EA
Mine dewatering	No change to the Pit Top Collection system, or to current discharges into the Coxs River Two new dewatering facilities to be installed at Bore 7 and Bore 8 New pipelines to tee into the existing SDWTS to be buried next to the proposed access track No other changes are proposed to the SDWTS.	• Groundwater assessment • Surface water assessment including Site Water Balance which will assess discharge / transfer requirements • Capacity of the SDWTS to manage the water make	Approval no longer required for Bore 7 therefore the following sections address Bore 8 only. • Groundwater assessment – **Section 7.2** • Surface water assessment – **Section 7.11**
Production	Increased production to 4.0 mtpa.	GHG assessment	Approval no longer sought for increased production therefore not applicable.
ROM Stockpile	No change to current stockpile capacity	Air Quality assessment (increased tonnes handled). Noise assessment	Approval no longer sought for increased production therefore not applicable.
Coal Preparation	Extended flow of coal to pass through the coal Crushing and Screening Plant	Air Quality assessment (increased tonnes handled). Noise assessment	Approval no longer sought for increased production therefore not applicable.
Land Preparation	Land clearance will be required for the drill pad and supporting ancillary infrastructure. Existing access tracks will be augmented and upgraded.	• Surface water assessment • Erosion and sediment assessment – construction & final landscape • Flora and Fauna assessment (biodiversity offset strategy) • Air quality assessment to determine impact from disturbed land on surrounding environment/sensitive receptors. • Archaeology assessment. • Impact on existing landuse (forestry)	• Surface water assessment – **Section 7.11** • Surface water assessment – **Section 7.11** • Ecology – **Section 7.4** • Air quality assessment – **Section 7.7** • Aboriginal and European Heritage – **Section 7.6** • Agricultural Impact Assessment – **Section 7.15**
Product Coal Transport	No change with the exception of increased tonnage on a per annum basis	• Air Quality assessment (increased tonnes handled). • Noise assessment • Infrastructure review to ensure current plant and equipment has sufficient capacity to manage tonnes (including reject emplacement area).	Approval no longer sought for increased production therefore not applicable.

Key Feature	Proposed Change	Environmental Assessment Considerations	Comment/ Where addressed in EA
Site Water Management	No change; utilise the existing Springvale infrastructure at the Pit Top. No change to the EPL or LDP001.	• Surface water assessment including clean / dirty water management and erosion and sediment controls	• Surface water assessment – **Section 7.11**
Rehabilitation	Rehabilitation of the Bore 5 and Bore 6 facilities. Partial rehabilitation of the Bore 7 and Bore 8 compounds following construction and commissioning Full rehabilitation of the site and ancillary infrastructure corridors following eventual facility decommissioning	• Soil and land assessment and rehabilitation strategy for the dewatering borehole site and associated infrastructure.	• Soils, Land Capability and Agricultural Suitability – **Section 7.14** • Rehabilitation and Closure – **Section 7.12**

5.2 Commonwealth Legislation

5.2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) and provides a legal framework to protect and manage nationally important flora, fauna, ecological communities and heritage places defined as matters of national environmental significance (NES). An action that "*has, will have or is likely to have a significant impact on a matter of National Environmental Significance*" may not be undertaken without prior approval from the Commonwealth Minister, as provided under Part 9 of the EPBC Act.

An approval under Section 130(1) and 133 of the EPBC Act was granted on 14 March 2012 for the extraction of coal from LW415 to LW417.

An assessment of whether this Project may have a significant impact on any matters of NES or on the environment of Commonwealth land was undertaken during the EA investigations and preparation. Specifically, RPS, who prepared the appended Flora and Fauna Assessment (2012a) and Aboriginal Cultural Heritage Assessment (2012b), conducted an online search of the EPBC Act Protected Matters Search Database (accessed on the 23 March 2012) to generate a list of those matters of NES within a 10 km radius of their defined Study Area.

The Study Area is not owned by the Commonwealth, and hence this portion of the Act is not applicable. In relation to the eight matters of NES prescribed under the EPBC Act, as they relate to the Project, the Protected Matters search found the following:

World Heritage Properties

There are no World Heritage Properties identified within the Study Area. The Gardens of Stone National Park, a World Heritage Property, is located approximately 7 km to the north of the Study Area. However, given the distance from this National Park and the small scale of the Project it is not expected to have a significant impact upon this World Heritage Property.

National Heritage Places

There are no National Heritage Places identified within or surrounding the Study Area. A search of the *Australian Heritage Database*, which incorporates the *National Heritage List*, the *Register of National Estate* and the *Commonwealth Heritage List*, found no references within the vicinity of the Study Area (RPS 2012b).

Wetlands of International Significance (RAMSAR Wetlands)

There are no wetlands protected by international treaty (the RAMSAR Convention) within or surrounding the Study Area.

Great Barrier Reef Marine Park

The Great Barrier Reef Marine Park in Queensland is significantly removed from the Study Area.

Commonwealth Marine Areas

There are no Commonwealth marine areas identified within or surrounding the Study Area.

Nationally Listed Threatened Species and Ecological Communities

Five threatened fauna species, no threatened flora species and no Threatened Ecological Communities are considered to potentially occur within the Study Area. The Flora and Fauna Assessment (RPS, 2012a) concludes that the Project is unlikely to have a significant impact on any of these species. Further detail on potential impacts on threatened species is provided in **Section 7.4**.

Nationally Listed Migratory Species

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

Further detail on the assessment of potential impacts on migratory species is provided in **Section 7.4.**

All Nuclear Actions

No type of nuclear activity is proposed at Springvale.

Based on the above, the Project is unlikely to have a significant impact upon any matters of NES. As such, RPS advised that it is reasonable to conclude the Project would not result in a Controlled Action.

5.2.2 National Greenhouse and Energy Reporting Act 2007

The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) provides a single national framework for the reporting and dissemination of information about GHG emissions, greenhouse gas projects, and energy use and production of corporations. It makes registration and reporting mandatory for corporations whose energy production, energy use or GHG emissions meet specified thresholds. Centennial reports emissions from the corporation on an annual basis, including those from Springvale, in accordance with the NGER Act.

The GHG assessment of the Project was conducted using relevant data that has been independently audited and verified to meet the requirements of the NGER Act (SLR, 2012b). The outcomes of the GHG assessment are provided in **Section 7.8**.

5.2.3 Native Title Act 1993

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

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

Bore 8 will be constructed on Crown Land. To the extent native title has not been extinguished over this land, Springvale Coal will need to comply with the applicable requirements of the *Native Title Act 1993* before obtaining a mining lease necessary to confer the tenure required to authorise it to construct Bore 8 on the Crown Land.

5.3 NSW State Legislation

5.3.1 Environmental Planning and Assessment Act 1979

The EP&A Act is the principal piece of legislation overseeing the assessment and determination of development proposals in NSW. It aims to encourage the proper management, development and conservation of resources, environmental protection and ecological sustainable development.

As discussed in **Section 5.1**, Springvale seeks to modify development consent S91/06569/001 pertaining to Springvale under Section 75W of the EP&A Act to permit an additional mine dewatering facility.

5.3.2 Other Key NSW State Legislation

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) establishes the State's environmental regulatory framework and includes licensing requirements for certain activities. Coal mining and coal works are premises–based activities under Schedule 1 of the POEO Act. On this basis, the occupier of the premises must hold an EPL administered by the EPA under Section 43(b) of the POEO Act.

Springvale operates under EPL3607, which authorises mining for coal to a scale of up to 3.5 Mtpa and coal works up to a scale of 5 Mt loaded per annum. A copy of the EPL is contained within **Appendix D.**

A variation to EPL3607 will not be required as a result of the Project.

Mining Act 1992

Springvale operates under the authorities summarised in **Table 3** and illustrated on **Figure 3**. The proposed Bore 8 is within ML 1588; however this ML applies to 20 m below the surface and beyond. Therefore a separate ML will be required for the Bore 8 dewatering facility under the provisions of the *Mining Act 1992*.

Coal Mine Health and Safety Act 2002

Bore 8 will be constructed and operated in accordance with the requirements of the *Coal Mine Health and Safety Act 2002* and the *Coal Mine Health and Safety Regulation 2006*, in consultation with DRE of DTIRIS.

Water Act 1912 and Water Management Act 2000

The *Water Management Act 2000* and the *Water Act 1912* contain provisions for the licensing, allocation, capture and use of water resources. Generally, where a water sharing plan under the *Water Management Act 2000* applies to the water sources in an area, the provisions of the *Water Act 1912* are ousted.

Springvale currently holds three groundwater licences, as detailed in **Table 9**.

Table 9 – Groundwater Licences held by Springvale

	Licence Number	Issuing Authority	Valid to	Extraction Limit (ML/year)	Description
Groundwater Licences (*Water Act 1912*)	10BL603519	NSW Office of Water	24 February 2015	5,958	Mine Dewatering Bore 6.
	10BL602017	NSW Office of Water	03 September 2012	585	Pit Top Collection System.
	10BL601863	NSW Office of Water	03 September 2012	3,300	Dewatering borehole at Ventilation Shaft 3 compound.

Bore 8 will require a licence to allow for the extraction of water from the bore. To this end, an application will be submitted to the NSW Office of Water to transfer the licence associated with Bore 6 to Bore 8. The groundwater assessment included an assessment of the likely volume of groundwater to be extracted from Bore 8, compared to the volume currently licenced for extraction from Bore 6. The groundwater assessment recommends an increase in the licence allocation from 5,958 ML/yr to 6,180 Ml/yr (refer **Appendix G**), a value which falls in the 95th percentile of recorded flows.

The water resources within the Project Application Area are regulated by the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011*. This Water Sharing Plan establishes a bulk access regime for the extraction of water under access licences to 13 specified groundwater sources (Part 1 Clause 4). One of the groundwater sources listed in Clause 4, the *Sydney Basin Blue Mountains Groundwater Source*, is relevant to the extraction of LW415 to LW419 as this water source lies in the Narrabeen Group rocks including the Banks Wall Sandstone. Two other groundwater sources in the region, the *Coxs River Fractured Rock Water Source* and the *Sydney Basin Coxs River Groundwater Source* do not apply as the proposed longwall panels are located in the Colo River Catchment.

National Parks and Wildlife Act 1994

The *National Parks and Wildlife Act 1974* (NP&W Act) contains provisions for the protection and management of national parks, historic sites, nature reserves and Aboriginal heritage throughout NSW. The Cultural Heritage Impact Assessment (RPS 2012b) prepared for the Project (see **Section 7.6** and **Appendix J**) did not identify any Aboriginal heritage sites within the Study Area.

Heritage Act 1977

Historical archaeological relics, buildings, structures, archaeological deposits and features are protected under the *Heritage Act 1977* (Heritage Act). RPS (2012b) undertook a search of the NSW Heritage Database as part of the Cultural Heritage Assessment (refer **Section 7.6**), which found no references to items of heritage significance within the Study Area.

Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) is administered by the OEH and includes provisions to declare and protect threatened species, populations and ecological communities. One threatened flora species (*Persoonia hindii*) listed under the TSC Act has been recorded within the Study Area, whilst a range of threatened fauna species occur within the Study Area and its surrounds, including the Gang Gang cockatoo (*Callocephalon fimbriatum*), Scarlet Robin (*Petroica boodang*), Flame Robin (*Petroica phoenicea*) and Masked Owl (*Tyto novaehollandiae*).

Due to the relatively small disturbance associated with the Project and high degree of connectivity with the larger areas of suitable habitat on the Newnes Plateau, RPS (2012a) concludes that the Project is unlikely to significantly impact on any species, population or ecological community listed under the TSC Act.

5.4 State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) are legal Environmental Planning Instruments (EPIs) prepared by the Minister to address issues significant to NSW. The SEPPs outlined in the below sub–sections are relevant considerations for this Project.

5.4.1 SEPP No. 33 – Hazardous and Offensive Development

SEPP No. 33 – Hazardous and Offensive Development links the permissibility of industrial development proposals to their individual safety and environmental performance. Certain activities may involve handling, storing or processing a range of materials which, in the absence of location, technical and/or operational controls, may create an off–site risk or offence to people, property or the environment. Such activities would be defined as 'potentially hazardous industry' or 'potential offensive industry'.

Hazardous industry is limited to industrial developments which after all measures proposed to reduce or minimise its impact have been employed, the industry would still pose a significant risk to the surrounding populace and/or biophysical environment. With the continued implementation of best management practices for hydrocarbons used on–site, as well as effective implementation of the approved environmental management plans and occupation health and safety management systems, the proposed modification would not pose any significant risk to the people, property or environment over and above the currently approved Springvale operation.

Furthermore, in determining whether an industrial development proposal has the potential to be offensive, the level of offence is not considered significant if the relevant authority is willing to issue a licence under its environment and/or pollution control legislation. In this case, if the OEH considers that the conditions of Springvale's EPL 3607 can be met, then the proposal is highly unlikely to be offensive.

5.4.2 SEPP No. 44 – Koala Habitat Protection

SEPP No. 44 – Koala Habitat Protection provides for the protection of koala habitat by ensuring that areas subject to development proposals are considered for their value as habitat or potential habitat for koalas. Greater Lithgow LGA is listed under Schedule 1 of SEPP No. 44 as a local government area to which the SEPP applies.

The Flora and Fauna Assessment prepared by RPS (2012a) for the Project concludes the following in relation to SEPP No. 44:

> *One Koala feed tree species (Eucalyptus viminalis) occurred within the Study Area, however the density of E. viminalis (<15%) suggest that the site is not core Koala habitat as defined in SEPP 44.*

5.4.3 SEPP No. 55 – Remediation of Land

SEPP No. 55 – Remediation of Land provides for a state–wide planning approach to the remediation of contaminated land in order to reduce the risk to human health or any other aspect of the environment. Under the SEPP, a consent authority must not consent to the carrying out of development on land unless it has considered any potential contamination issues.

The Project is a modification of the existing approved Springvale operation, involving an additional dewatering facility. With the continued implementation of best management practices for hydrocarbons, as well as effective implementation of the approved environmental management plans and occupation health and safety management systems, the potential for contamination and associated issues is considered to be low.

Land contamination will be considered and addressed during the preparation of the next MOP or MOP variation.

5.4.4 SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of NSW. The Mining SEPP provides that development for the purpose of underground mining may be carried out with development consent on any land (and overrides anything to the contrary contained in a Local Environmental Plan), and defines mining developments that are prohibited, exempt or complying development.

The provisions of the Mining SEPP requiring specified matters to be taken into account have been drafted using the language of Part 4 of the EP&A Act and do not expressly apply to Part 3A. However, given that the development consent pertaining to Springvale, if modified, will not become an approval under Part 3A, but will remain a Part 4 consent, the Mining SEPP has been considered.

Part 3, specifically Clauses 12 to 17 (inclusive), of the Mining SEPP requires consideration to be given to the compatibility of projects with other surrounding land uses, natural resource management, environmental management and rehabilitation. The information presented in this EA addresses each of these matters and indicates that the proposed modification should not have any significant impacts over and above the currently approved development. The assessment has been multi–disciplinary and involved consultation with various government agencies and stakeholders. Emphasis has been placed on anticipation and prevention of potential environmental and social impacts, with appropriate management strategies, mitigation measures and monitoring activities identified.

Environmental management plans and monitoring programs currently in place at Springvale will be reviewed and updated, as required to incorporate the proposed Project, commitments made in this EA and any additional consent conditions. Decommissioning and removal of the additional surface infrastructure proposed as part of the Project and subsequent rehabilitation activities at Springvale will be considered and addressed during the next revision of the MOP.

5.5 Local Environmental Plans

Local Environmental Plans (LEPs) are legal EPIs that guide planning decisions for LGAs and allow Councils to supervise the ways in which land is used through zoning and development consents.

As previously advised, the Project Application Area is situated within the Lithgow LGA. The LEP of Lithgow City Council is addressed below.

5.5.1 Lithgow Local Environment Plan 1994

Under the provisions of the *Lithgow Local Environmental Plan 1994*, the Project Application Area is within an area zoned 1(f) Forestry. Development for the purpose of extractive industries and mining is permissible with development consent in this zone.

The objectives of Zone 1(f) include:

1. To identify land managed by the Forestry Commission under the *Forestry Act 1916*;

2. To preserve existing forests within the City of Lithgow, while allowing compatible development, and

3. To prevent pollution of water supply catchments and water quality in major water storages.

These objectives have been considered in this EA. Consultation has been undertaken with Forests NSW throughout the process, as discussed in **Section 6**, given that the Project Application Area is located within land managed by Forests NSW. With regards to the second objective listed above, clearing associated with the Project will be kept to a minimum as much as possible by using existing tracks to gain access to Bore 8. In addition, in relation to the third objective, a Surface Water Assessment of the Project has been conducted, and as part of this assessment mitigation measures were identified to ensure the potential for any impacts on downstream water quality is minimised as much as possible. Further detail on the outcomes of the Surface Water Assessment is provided in **Section 7.11**.

5.6 Other Planning Considerations

5.6.1 Strategic Regional Land Use Policy

The NSW Government released the draft Strategic Regional Land Use Policy on 6 March 2012. This Policy provides a position on strategic land use planning in regional areas, an outline of transitional arrangements, proposed reforms to the planning assessment and approval process and a timeline to initiate commitments provided in the policy.

To date, two Strategic Regional Land Use Plans (SRLUPs) have been released: the Upper Hunter and New England North West. Springvale is not located within an area mapped by a SRLUP, and DGRs were not issued for the Project requiring the preparation of an Agricultural Impact Statement (AIS). However, the draft Upper Hunter Strategic Regional Land Use Plan states that:

> *'as an interim measure, until strategic agricultural land mapping has been finalised an AIS will be required for all state significant development application for mining and coal seam gas proposals in the region which would potentially impact on agricultural resources or industries.'*

Whilst this Project is not a State Significant Development Application, an assessment of the potential impacts on agricultural resources has been prepared as part of the environmental assessment of the Project (refer **Section 7.15**) to ensure impacts on agriculture are considered, particularly given the location of the Project Application Area in the Newnes State Forest.

6.0 CONSULTATION

6.1 Overview

Consultation has been undertaken with state and federal government, government agencies, the local Aboriginal Community and other relevant stakeholders during the preparation of this EA. The sections below provide detail on the consultation conducted.

6.2 State Government Consultation

6.2.1 Department of Planning and Infrastructure

A meeting was held on 21 November 2011 between Centennial and the DP&I to discuss various upcoming Centennial projects, including the proposed modification at Springvale. The issue of whether DGRs were to be issued for the Project was discussed at this meeting, and that they may not be required due to the scale and nature of the Project.

Following this meeting, an email was sent to the DP&I on 10 December 2011 from Centennial seeking to confirm both the approval pathway for the Project, and that DGRs were not required. A response was received on the 21 December 2011 from the Department, confirming that Section 75W was the appropriate approval pathway for the modification. DP&I also confirmed that DGRs would not be issued for the Project, and that the EA should be prepared in accordance with the assessment considerations put forward by Springvale Coal in the email on 10 December 2011.

A copy of this email correspondence is included in **Appendix E**.

6.2.2 NSW Office of Water

A meeting was held between Springvale and the NOW on the 04 April 2012 to discuss the relevant aspects of the modification, in particular the groundwater impact assessment requirements for the Project. The following was discussed:

- The EA and the groundwater assessment for the modification will assess impacts of the construction and operation of boreholes on the local and regional aquifers (both shallow and deep groundwater), and groundwater dependent ecosystems in the vicinity of the proposed bore site.
- A hydrogeological model would not be presented in the groundwater assessment; however, mine inflows in progressing from LW416 to LW419 would be quantified.
- With regards to the hydrogeological model that Springvale is currently developing, NOW has asked a presentation to be made on the model development methodology prior to its finalisation.
- With regards to the applicability of the project on the relevant water sharing plan NOW advised that they would be working within the guidelines of the plans, and that their preference would be for the extraction allowance for the proposed bore to fall within the already approved allocation for Bore 6.
- Springvale will request the transfer of the Bore 6 licence to the Bore 8 licence.

Further communications were initiated with NOW on 28 August 2012 following the completion of the groundwater assessment regarding the transfer of licence allocation from Bore 6 to Bore 8. These discussions are continuing.

6.2.3 Office of Environment and Heritage

A meeting was held with the OEH in Bathurst on the 02 March 2012 to discuss the relevant aspects of the modification. At this meeting the OEH was provided an outline of the Project, the identified potential environmental impacts and the assessments being undertaken. The key issues raised by the OEH were as follows:

- Management of heritage sites, if required, by the Project;
- Level of community consultation undertaken;
- Sediment controls to be implemented during construction phase; and
- The extent of the proposed modification to the pipeline associated with the existing SDWTS

The OEH officers noted that their colleagues from the Dubbo OEH would be interested in the potential impact of the Project on any threatened species including *Persoonia hindii* known to occur on Newnes Plateau, and in the vicinity of Bore 6 location. The advice was to minimise impacts of the Project on threatened species including *Persoonia hindii* within or in the vicinity of the Project Application Area.

6.2.4 Hawkesbury Nepean Catchment Management Authority and Sydney Catchment Authority

A meeting with the Hawkesbury–Nepean Catchment Authority (HNCMA) and Sydney Catchment Authority (SCA) was held on 02 March 2012 to provide them with the Project scope, the identified environmental impacts and the assessment being undertaken.

The following clarifications were sought and/or issues were raised by HNCMA:

- Clarifications on the components of the Project falling within the Hawkesbury–Nepean Catchment;
- Supportive of underground pipeline and power cable;
- Impacts of the Project on the wider catchment;
- Extent of disturbance caused by the construction works; and
- Expectation of installation of appropriate erosion and sediment controls during construction phase of the project.

The following clarifications were sought and/or issues were raised by SCA:

- The final destination of the mine water from Bore 8 and Centennial's Regional Water Strategy;
- Management of surface water discharges; and
- Expectation of NorBE (Neutral or Beneficial Effect) for any impact on the Sydney Catchment Water Catchment.

6.2.5 Department of Trade and Investment, Regional Infrastructure and Services

A meeting with DTIRIS was held on 08 March 2012 to provide the Project cope, the identified environmental impacts and the assessment being undertaken. DTIRIS requested the following components be included in the EA:

- Rehabilitation, final landform and closure; and
- Confirmation of land ownership/tenure.

6.2.6 Road and Maritime Services

A meeting was held with the Road and Maritime Services (RMS) on 28 February 2012 to present a number of Centennial's current projects from their Western Operations, including the Bore 8 Project. No issues relating to the Bore 8 Project were raised by RMS.

6.2.7 Department of Primary Industry – Forests NSW

Springvale conducts ongoing consultation with Forests NSW in relation to works associated with the mining operation, subsidence monitoring and exploration activities conducted by Springvale within the Newnes State Forest. These works are carried out in accordance with the terms of an agreement held with Forests NSW.

Further to this ongoing consultation, Forests NSW was consulted specifically regarding the proposed construction and operation of Bore 8. This consultation involved attendance at the initial pre–project risk assessment (refer **Section 7.1**) held in November 2011, as well as follow up consultation regarding the specific area to be cleared for the Project and any requirements Forests NSW may have in relation to this clearing.

At the pre–project risk assessment Forests NSW raised the following:

- The requirement for an Occupation Permit to undertake the proposed activities within the Newnes State Forest; and
- A possibility of a change in tenure from State Forest to State Conservation Area in the long term which could restrict access to the borehole site.

In relation to the Occupation Permit, Springvale holds permit 2349 for land use for activities associated with mineral exploration, as discussed in **Section 3.2**. Springvale will continue to consult with Forests NSW regarding these matters.

A further meeting with NSW Forests was held on 28 February 2012 to present a number of Centennial's projects from the western operations, namely the Angus Place Ventilation Facility Project, Springvale Coal Services Project and the Bore 8 Project. The following matters relating to the Bore 8 project were discussed:

- Bushfire management;
- Traffic movements during the construction and operational phases of the Project;
- Operational requirements for access tracks, and in particular the requirement to include in the EA plans showing the pipeline and power cable routes;
- Trenched power cables would be preferred as easier to manage in the long term for prevention of fire and misuse of the easements;
- Timing of the Bore 6 decommissioning including the 11 kV powerline supplying the Bore 6 site; and
- Tenure requirements for mine infrastructure specifically that a mining purposes lease will be required for the Bore 8 site.

Further to the risk assessment and meeting held on 28 February 2012, consultation via telephone call with Forests NSW regarding the area of vegetation to be cleared as part of the Project was undertaken. In particular, whether there would be anything of commercial value to Forests NSW in the vegetation cleared, and the question of whether a rental agreement would be required to compensate Forests NSW for the loss of timber production potential.

Forests NSW confirmed Bore 8 does not have commercial forestry value. Springvale will continue to consult with Forests NSW to ascertain whether a rental agreement is required, the value of which has been estimated at this stage as $400/ha/year by Forests NSW.

6.3 Delta Electricity

Consultation with Delta Electricity on the existing SDWTS is ongoing on the potential interactions with their business.

6.4 Lithgow City Council

A meeting was held with the Lithgow City Council (LCC) on 17 May 2012, in which Springvale gave a presentation on the Bore 8 Project. Questions from LCC regarding the Project centred mainly around the extent of ecological surveys conducted to understand the potential impacts occurring on threatened species and endangered ecological communities (EEC). LCC requested that local constructors be used for surface infrastructure construction works. LCC advised they would comment on the EA when submitted.

The meeting of 17 May 2012 concluded with the request by LCC that Centennial update Councillors of the Bore 8 Project as well as all other upcoming Centennial projects. On 11 July 2012 Centennial senior management presented an overview of all projects from the Western Operations, including the Bore 8 Project, to Councillors including the LCC General Manager, the Mayor, and the Deputy Mayor.

6.5 Australian Federal Government

A meeting was held on 15 June 2012 between Centennial and the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) to discuss various upcoming Centennial projects, including the proposed modification at Springvale.

Following the June meeting, a second meeting was held with SEWPaC on 27 June 2012 to specifically discuss the proposed Springvale modification, and the potential impacts of the Project on EPBC Act matters of national environmental significance. The discussions were mainly based on the results of a 'self–assessment' undertaken by Centennial for the Project in accordance with the four assessment criteria contained in SEWPAC's *Matters of National Environmental Significance: Significant impact guidelines 1.1* (Commonwealth of Australia, 2009).

As will be discussed in **Section 9**, the Project originally included the construction and operation of a second dewatering facility, Bore 7. The proposed location of this bore was in close proximity to occurrences of Newnes Plateau Hanging Swamps, a community which corresponds to the Temperate Highland Peat Swamps on Sandstone (THPSS) vegetation community, which is listed as a Threatened Ecological Community (TEC) under the EPBC Act. The close proximity of Bore 7 and associated access track (within 10 m in some parts) to this TEC primarily formed the basis of consultation with SEWPaC.

Springvale is no longer seeking approval for the construction of Bore 7 for reasons further discussed in **Section 9**. The closest occurrence of the THPSS to the Project Application Area associated with Bore 8 is approximately 100 m from the access track to Bore 8, with other occurrences of the community more than 300 m away. The Fauna and Flora Assessment (RPS, 2012a) states that it is reasonable to conclude the Project would not be declared a controlled action.

Further detail in relation to the outcomes of the Fauna and Flora Assessment is provided in **Section 7.4**.

6.6 Community Consultation

Centennial held three community workshops in March 2012 to discuss a number of Projects being undertaken by Centennial within their Western Operations, including the proposed Springvale modification. At this meeting a number of issues relating to the Project were discussed as follows:

- Potential impacts on the Newnes Plateau Hanging Swamps;
- Potential impacts to bushwalking amenity; and
- Continuity of employment of the current mine staff and the flow–on effect in the region, such as continued employment of local contractors.

No concerns specifically regarding the Bore 8 Project were raised at the meeting.

6.7 Aboriginal Community Consultation

Consultation with Aboriginal stakeholders was undertaken by Centennial and RPS, who was engaged to assess cultural heritage issues associated with the Project, in accordance with the guideline document titled *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (ACHCRs) (DECCW 2010). The ACHCRs include a four stage Aboriginal consultation process and stipulates specific timeframes for each stage.

Stage 1 requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment.

As there are a number of concurrent projects occurring across the Centennial Western Region mining leases, the consultation process was streamlined to include all active projects, rather than running multiple individual consultation processes. To this end, letters were sent to the relevant OEH regional office, the Bathurst Local Aboriginal Land Council, the registrar of Aboriginal owners, the Native Title Tribunal, Native Title Services Corporation Limited, Lithgow City Council and the Blue Mountains Catchment Management Authority requesting the identification of interested Aboriginal groups for projects involving the Centennial operations of Springvale, Angus Place, Neubecks, Clarence, Lidsdale and Springvale Coal Services.

An advertisement was also placed in the Lithgow Mercury on 6 October 2011 calling for registration of interest for Aboriginal Cultural Knowledge Holders in the Capertee, Blackmans Flat, Lidsdale and Newnes Plateau localities.

As a result of the invitation for expression of interest and the advertisement, the following Aboriginal Community Stakeholders registered their interest.

- Warrabinga Native Title Claimants Aboriginal Corporation;
- North–East Wiradjuri;
- Bathurst Local Aboriginal Land Council;
- Gundungurra Tribal Council Aboriginal Corporation;
- Mingaan Aboriginal Corporation;
- Eddy Neuman Lawyers (representing Gundungurra Tribal Council Aboriginal Corporation);
- Teitzel & Partners (representing Wiray–dyuraa Ngambaay–dyil and Wiray–dyuraa Maying–gu);
- Mooka Traditional Owners;
- Wiradjuri Council of Elders; and

- Blackshield Lawyers (representing Warrabinga/Wiradjuri people).

Information regarding the proposed heritage assessment methodology and strategy for collecting information on cultural heritage significance was provided in writing to the Aboriginal stakeholders on 23 November 2011. The following six groups returned their comments on the methodology by the closing date for comments:

- Mingaan Aboriginal Corporation;
- Warrabinga Native Title Claimants Aboriginal Corporation;
- Gundungurra Tribal Council Aboriginal Corporation;
- North East Wiradjuri;
- Wiray–dyuraa Ngambaay–dyil and Wiray–dyuraa Maying–gu; and
- Bathurst Local Aboriginal Land Council.

In addition, the letter of 23 November 2011 invited registered Aboriginal stakeholders to attend an information session on 7 December 2011. This information session included a formal presentation of the relevant upcoming Centennial projects as well as a Questions and Answers session in order to allow Aboriginal stakeholders to clarify any heritage, methodological or timing issues regarding the projects. Representatives from the following groups attended the information session on 7 December 2011:

- Gundungurra Tribal Council Aboriginal Corporation;
- Mingaan Aboriginal Corporation;
- North East Wiradjuri;
- Warrabinga Native Title Claimants Aboriginal Corporation; and
- Wiradjuri Council of Elders.

According to the ACHCR process a site survey should be undertaken with reference to the nature, scale and complexity of the Project. With these factors considered, five stakeholders were invited to participate in the survey which was undertaken on 12 January 2012 as follows:

- Gundungurra Tribal Council Aboriginal Corporation – Trevor Brown
- North East Wiradjuri – Jack Pennell
- Warrabinga Native Title Claimants Aboriginal Corporation – Kevin Williams
- Bathurst Local Aboriginal Land Council – Richard Peters
- Mingaan Aboriginal Corporation – Elwin Wolfenden

Following the field survey, the draft Aboriginal Cultural Heritage Assessment report was prepared and provided to all registered stakeholders on 1 June 2012 for comment prior to finalisation. Gundungurra Tribal Council Aboriginal Corporation returned their comments on the draft report by the closing date for comments, and all other stakeholders were contacted by telephone on 29 June 2012 requesting their comments verbally. No issues were raised by any stakeholders with the draft report.

The Aboriginal Consultation Log and responses received from the Aboriginal community stakeholders are appended to RPS's *Cultural Heritage Impact Assessment* (2012b) in **Appendix J**.

Additional consultation with the Gundungurra Native Title Claim Group in February 2012 concentrated on potential disturbance and management of Aboriginal heritage sites and the adherence to the signed deed of agreement, entitled the Centennial Projects Ancillary Deed of 2003, with the Gundungurra Community.

6.8 Future Consultation

Consultation with the identified stakeholders will be ongoing and will be undertaken in accordance with the Stakeholder Engagement Plan. In addition, the Centennial website will provide updates on the Project for all stakeholders while the internal stakeholders (Centennial employees and contractors) will also be given toolbox talks on the Project.

6.9 Consultation Summary

A summary of the key issues raised by the stakeholders and how these issues were addressed as part of the EA preparation are presented in **Table 10**. References to the relevant sections of the EA are also provided in this table.

Table 10 – Summary of Consultation Undertaken and Issues Raised

Stakeholder	Date and Method of Consultation	Issue Raised	Response to Issue	EA Reference
Department of Planning and Infrastructure	21 November 2011 – meeting 10 December 2011 – email from Centennial 21 December 2011 – email response from DP&I	• Confirmation of approval pathway and if DGRs would be required given the scale and nature of the Project.	• Email received from Howard Reed confirming the Section 75W modification approval pathway and that DGRs would not be issued for the Project.	Section 6.2.1
NSW Office of Water	4 April 2012 – meeting	• Impacts of construction and operation of Bore 8 on the local and regional aquifers and groundwater dependant ecosystems. • Quantification of mine inflows in progressing from LW416 to LW419.	• Groundwater Assessment undertaken, and concludes that construction and operation of the bore will result in negligible groundwater related impacts. • Included in the scope of the Groundwater Assessment. Inflows are anticipated to increase slightly as the mine progresses east.	Section 7.2 Section 5.3.2
	28 August 2012 – Email regarding groundwater licences and transfer of 400 ML of allocation from Ventilation Shaft 3 Facility to Bore 6 and subsequently Bore 8.	• Preference for the extraction allowance for Bore 8 to fall within the already approved allocation for Bore 6. • Transfer of Bore 6 licence to Bore 8.	• Licensing requirements addressed in Section 5.3.2. • Request to transfer licence allocation from Bore 6 to Bore 8 initiated.	Section 5.3.2 Section 6.2.2
Office of Environment and Heritage	2 March 2012 – meeting	• Management of heritage sites. • Level of community consultation undertaken. • Sediment controls to be implemented during construction phase.	• Cultural Heritage Impact Assessment undertaken. No sites identified within the Study Area. • Consultation undertaken with registered Aboriginal stakeholders in accordance with ACHCRs. 3 community workshops also held with the wider community to discuss the Project. • Surface Water Assessment undertaken and controls recommended.	Section 7.6 Section 6.5 Section 7.11

Stakeholder	Date and Method of Consultation	Issue Raised	Response to Issue	EA Reference
Hawkesbury Nepean Catchment Management Authority	2 March 2012 – meeting	• The components of the Project within the Hawkesbury Nepean Catchment. • Impacts of the Project on wider catchment. • Extent of disturbance caused by construction works, and installation of appropriate erosion and sediment controls.	• Surface Water Assessment undertaken, and concludes that offsite impacts on surface water resources and the receiving environment will be negligible.	Section 7.11
Sydney Catchment Authority	2 March 2012 – meeting	• The final destination of the mine water from Bore 8 and Centennial's Regional Water Strategy. • Management of surface water discharges. • Expectation of Neutral or Beneficial Effect for any impact on the Sydney Catchment Water Catchment.	• Water extracted from Bore 8 will be discharged into the existing Springvale–DWTS, as per existing arrangement for Bore 6. • Surface Water Assessment undertaken, and includes recommended controls to manage surface water runoff from the Project Application Area. • Surface Water Assessment concludes that offsite impacts on surface water resources and the receiving environment will be negligible.	Section 4 Section 7.11 Section 7.12
Department of Trade and Investment, Regional Infrastructure and Services	8 March 2012 – meeting	• Rehabilitation, final landform and closure. • Confirmation of landownership/tenure.	• Rehabilitation and closure addressed in Section 7.11. • Details on land ownership provided in Section 2.4	Section 7.12 Section 2.4
Roads and Maritime Services	28 February 2012 – meeting	No issues raised by RMS.		
Department of Primary Industries – Forest NSW	November 2011 – Pre–project risk assessment 23 February 2012 – meeting	• Occupation permit requirements. • Possibility of a change in tenure from State Forest to State Conservation Area noted. • Bushfire management.	• Springvale holds Occupation Permit 2349 with Forests NSW and will apply to for a variation to this permit to include the infrastructure associated with Bore 8. • Bushfire Assessment undertaken and an APZ to be established around Bore 8.	Section 4.5 Section 7.3

Stakeholder	Date and Method of Consultation	Issue Raised	Response to Issue	EA Reference
		• Traffic movements during construction and operation phase. • Operational requirements of access track, including plan showing pipeline and powerline location. • Timing of Bore 6 decommissioning. • A mining purposes lease will be required. • Rental agreement may be required.	• Traffic movements addressed in Section 4.10 • Figure 2 • Section on rehabilitation and closure • Section on rehabilitation and closure • Regulatory requirements included in Section 5. • Ongoing consultation with Forests NSW	Section 4.10 Section 7.12 Section 7.12 Section 5 Section 6.2.7
Delta Electricity	On–going	On–going consultation regarding the Springvale DWTS undertaken. No specific issues raised.		
Lithgow City Council	17 May 2012 – meeting 11 July 2012 – meeting	• Potential impact of the Project on threatened species and endangered ecological communities. • Local constructors used for surface infrastructure construction works.	• Ecological Assessment undertaken, which concludes that the Project is not anticipated to have a significant impact on any listed threatened species, populations or ecological communities. • Preference will be given to local contractors and other local providers when required and wherever practical for the provision of construction services.	Section 7.4
Australian Federal Government	15 June 2012 – meeting	• Potential impacts of the Project on matters of NES.	• Ecological Assessment undertaken, and concluded that the Project is unlikely to have a significant impact on any matters of NES.	Section 7.4
Community	March 2012 – 3 community workshops	• Potential impacts on the Newnes Plateau Hanging Swamps. • Potential impacts to bushwalking amenity. • Continuity of employment and flow–on effect in the region.	• Ecological Assessment undertaken. • Visual amenity addressed in Section 7.13 • Socio–economic impacts addressed in Section 7.16. The Project will enable the continuation of mining in the approved	Section 7.4 Section 7.13 Section 7.16

Stakeholder	Date and Method of Consultation	Issue Raised	Response to Issue	EA Reference
			panels and hence the flow–on socio–economic benefits.	
Aboriginal Community	October 2011 – June 2012 – various letters, meetings and field surveys	• Management of heritage sites. • No specific issued raised regarding the findings of the draft report.	• Cultural Heritage Impact Assessment undertaken. No cultural heritage sites identified within the Study Area.	Section 7.6

7.0 ENVIRONMENTAL IMPACT ASSESSMENT

7.1 Identification of Issues

The key project–related issues warranting detailed investigation and discussion were identified through a range of measures including:

- The existing environmental context of the Project and surrounding locality (see **Sections 2** and **7**);
- The legislative framework applicable to the Project (see **Section 5**);
- A broad brush pre–project risk assessment (see **Section 7.1.1**);
- The outcomes of consultation undertaken with government agencies and other relevant stakeholders (see **Section 6**); and
- Specialist studies completed as part of the preparation of the EA (see **Section 7**).

The risk assessment process and outcomes is discussed in the section below.

7.1.1 Pre–Project Risk Assessment

A broad–brush pre–project risk assessment was conducted on 17 November 2011 by GSSE and Springvale Coal with the aim of:

- Identifying those issues relating to the Project that represent the greatest risk to the local environment and community; and
- Assisting in setting the level of assessment required to address each identified risk within the EA.

A qualitative risk assessment methodology (using the Dyadem Stature Risk Management software) was adopted in general compliance with the requirements of the *Australian Standard AS/NZS ISO 31000:2009 – Risk Management – Principles and Guidelines* and in order to provide a consistent and reliable approach.

The Risk Assessment Report, including a Risk Register, prepared as part of this process to document the findings and outcomes is contained within **Appendix F.** This risk register considers both Bore 8, as well as the alternative location of Bore 7 (refer **Section 9**). The key environmental issues that were specifically addressed in the risk assessment include, but are not limited to, the following:

- Groundwater
- Bushfire
- Ecology
- Noise
- Cultural Heritage
- Greenhouse Gas
- Air Quality
- Waste Management
- Traffic and Transport
- Surface Water
- Rehabilitation and Closure
- Visual
- Land use/land capability

The various identified project–related issues were assessed in light of the mitigation measures and management strategies already in place at Springvale. Where an individual risk was considered

unacceptable, or where a knowledge gap was identified, a specialist study was commissioned and additional mitigation measures and/or management responses nominated.

The Centennial risk matrix used, and the management requirements in accordance with the Centennial Risk Standard and Risk Matrix is provided in **Table 11**.

Table 11 – Requirements for Management of Risks (Centennial Risk Standard)

Risk Ranking	Risk Category		Generic Management Actions
1 to 4	E	Extreme	Immediate intervention required from senior management to eliminate or reduce this risk.
5 to 9	H	High	Imperative to eliminate or reduce risk to lower level by the introduction of control measures. Management planning required at senior level.
10 to 15	S	Significant	Corrective action required, senior management attention needed to eliminate or reduce risk.
16 to 19	M	Moderate	Corrective action to be determined, management responsibility must be specified.
20 to 25	L	Low	Monitor and manage by corrective action were practicable.

The risk assessment did not identify any 'extreme' or 'high' environmental issues relating to the Project.

A number of environmental issues identified as relating to the Project were assigned a risk category of 'significant', as defined in **Table 11**, as follows:

- Unacceptable impacts on regional groundwater dependant ecosystems as a result of inadequate assessment of the groundwater model; and
- Unacceptable impacts on NSW and/or federally listed endangered species caused by the location of proposed mine dewatering infrastructure.

To ensure these aspects were assessed appropriately, specialist consultants were engaged to assess the potential impacts on groundwater, and flora and fauna.

Potential impacts to heritage sites, greenhouse emissions, air quality impacts, waste management and community engagement were ranked as 'moderate' risks associated with the Project.

Impacts relating to the aspects of traffic and transport, surface water, rehabilitation, visual amenity and land use/capability were ranked as a 'low' risk.

Damage or loss of dewatering infrastructure as a result of bushfire in the vicinity was also identified as a potentially 'significant' Project risk. Bushfire was therefore also considered in the EA (refer to **Section 7.3**).

The sections below contain a relevant assessment of all environmental issues to a level commensurate with their risk as identified above. This includes a description of the existing environment and an assessment of the potential environmental impacts associated with the proposed modification at Springvale, and recommends mitigation measures where applicable.

7.2 Groundwater

Aurecon (2012) assessed the potential for impacts on the local and regional hydrogeology from the activities associated with the construction and commissioning of Bore 8. In addition, Heritage Computing (2012) undertook a review of groundwater modelling at Springvale, and a groundwater mine inflow assessment of the Project, and this assessment is appended to the Aurecon (2012) report as Appendix A.

A copy of the Groundwater assessment is included in **Appendix G**, and the outcomes summarised below.

7.2.1 Existing Environment

Hydrogeology

Aurecon (2012) identified three basic groundwater systems in the region, which all have the potential to be impacted by the construction and operation of Bore 8. These groundwater systems are illustrated in **Plate 3**, and are described as follows:

- *Perched groundwater system* – a discontinuous, near–surface system generally independent of the regional groundwater systems. This system is located within 15 m of the ground surface, with the groundwater derived from excess rainfall unable to infiltrate into deeper systems by the presence of near–surface fine grained beds. Lateral seepage may be produced by a perched groundwater system, which supports hanging swamps;

- *Shallow groundwater system* –a regional groundwater system located in the Narrabeen Group above the Mount York Claystone, largely in the Banks Wall Sandstone, which contains aquifer zones that support Newnes Plateau Shrub Swamps, including the Sunnyside, Sunnyside East and Carne West Swamps. This system extends to a depth of approximately 100 m, with most groundwater flow in a horizontal direction along bedding planes and some vertical flow from ground surface infiltration.

- *Deep groundwater system* – a less important, deeper groundwater system exists in the strata below the Mount York Claystone, and includes the Illawarra Coal Measures which generally lie at a depth of more than 200 m. The few water bearing zones that occur at depth are usually fractured rock aquifers, and the groundwater in this system is largely drained into the goaf following longwall mining, and is therefore the source of the majority of mine water inflows. There are no known local or regional users of this groundwater source.

Permeability in the Banks Wall Sandstone is mostly low, with the exception of three horizons which could be considered to be ‘relative’ aquifers. Although no specific permeability testing has been undertaken in the Study Area, Aurecon (2012) state that the presence of permanently waterlogged swamps provides evidence of the existence of at least one major aquifer in the vicinity.

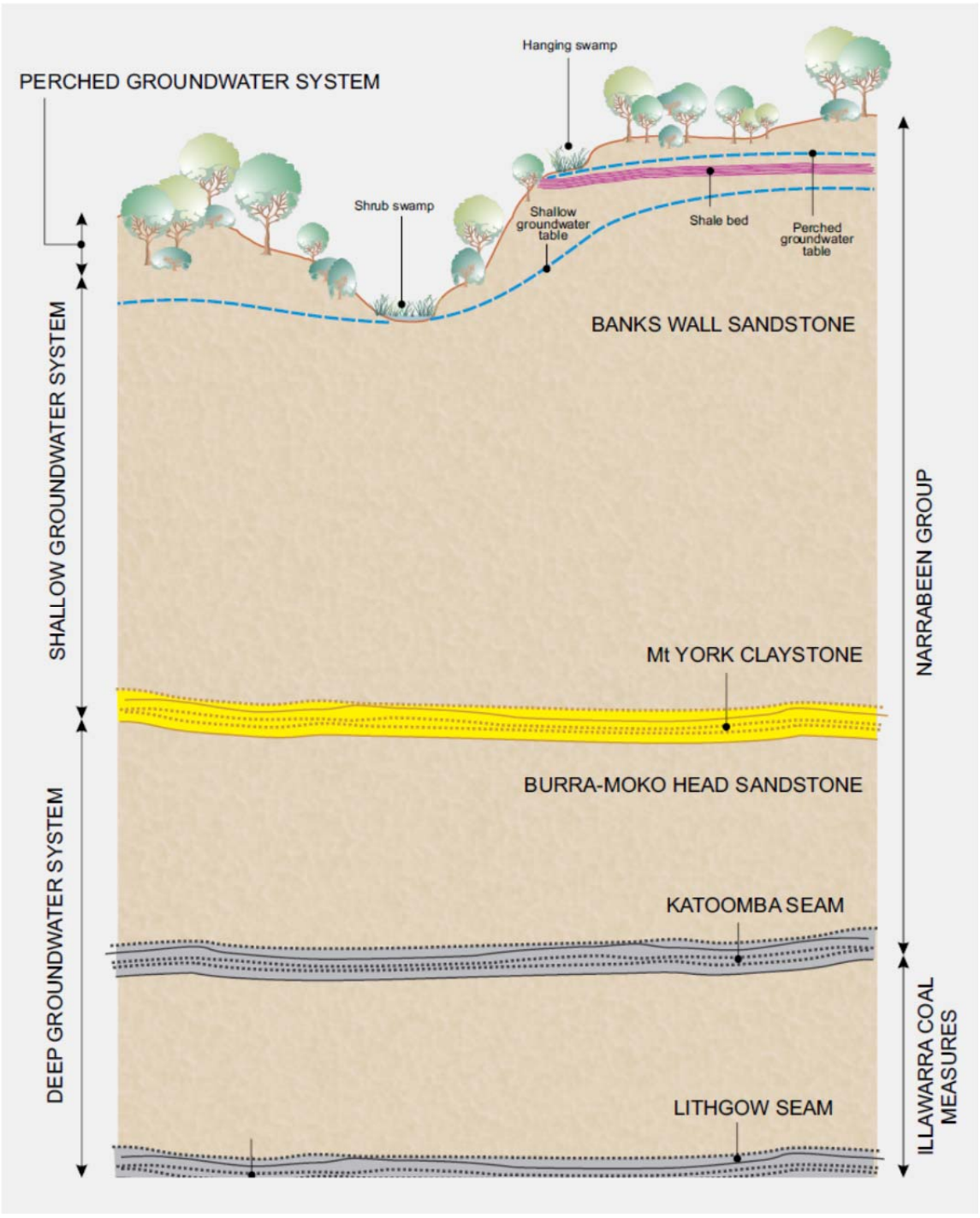


Plate 3 – Local hydrogeological regime (figure source: Aurecon 2012)

Swamps

A number of groundwater dependant ecosystems comprising the are present on the Newnes Plateau, known as the Newnes Plateau Shrub Swamps (Shrub Swamps) and the Newnes Plateau Hanging Swamps (Hanging Swamps). The Shrub Swamp community is listed as an EEC under the TSC Act, and along with the Hanging Swamp, forms part of the 'Temperate Highland Peat Swamps on Sandstone' (THPSS) community, which is listed as an EEC under the EPBC Act. The location of these swamps in relation to the Project Application Area is shown on **Figure 2**.

Groundwater monitoring by Aurecon has confirmed that there are a range of Shrub Swamp types which appear to differ in the relative contributions of groundwater and rainfall run–off to the swamp hydrology.

Swamps that are fed mostly by underground water are generally resistant to the natural variations in local rainfall patterns, and are termed permanently waterlogged swamps. These swamps are mostly located in broad deep valleys with a relatively large catchment, and have a relatively stable, near–surface groundwater table that shows no major fluctuations. In contrast, swamps with a relatively poor groundwater contribution are known as periodically waterlogged swamps, and show large variations in groundwater level depending on natural rainfall patterns. These swamps also tend to have small catchments, and support different vegetation from the permanently waterlogged swamps. The Shrub Swamps known as Sunnyside, Sunnyside East, and Carne West Swamps (refer Figure 1 in Aurecon, 2012), all in the vicinity of Bore 8, are permanently waterlogged swamps.

The Hanging Swamps are periodically waterlogged swamps, heavily reliant on rainfall, as they are supported by the perched shallow aquifers or seeps in the upper perched groundwater system. These are usually located higher in the landscape on the flanks of ridges, and can dry out in periods of below average rainfall as there is no recharge to the shallow perched aquifers.

Outside the Bore 8 Project Application area, Hanging Swamps are located several hundred metres away to the west of the proposed access track to Bore 8 (on the eastern flank of the ridge between Sunnyside East Swamp and Sunnyside Swamp), while one large Hanging Swamp is located to the east of Bore 8 at the downstream end of Carne West Swamp.

7.2.2 Potential Impacts

The potential hydrogeological risks associated with the proposed construction and operations of the dewatering bore were identified by Aurecon (2012) and include local, regional and cumulative impacts.

Potential Local Impacts

- Draining of perched groundwater into mine workings via the boreholes.

Four boreholes will be drilled at Bore 8 between the surface and the Lithgow coal seam (refer **Plate 3**) to provide access for the submersible pumps. These boreholes will intersect the perched groundwater system (refer **Plate 3**). Any disruption to this system could result in an adverse impact on the Hanging Swamps which are supported by this groundwater system.

During construction of the four bores using the blind boring method, as described in **Section 4.3**, it is unlikely that there will be any depletion of the perched groundwater in the boreholes. Whilst construction is in progress, the bores will form a void, into which there will be negligible drainage of groundwater as the bores will be full of drilling fluids. The drilling fluids are designed to block the pores in the strata so that there is minimal drilling fluid loss into the strata, and the drilling fluid conditions are adjusted to equalise hydrostatic pore pressure. It is possible that if the fluid level in the borehole is lowered during drilling (such as when the rod string is withdrawn), that a small volume of groundwater will drain into the borehole through the mud cake on the borehole walls. The volume of groundwater inflow will be limited to the volume required to restore the borehole level to the groundwater level in the perched groundwater system. The disturbance to the groundwater system will therefore be minimal, temporary and restricted to a small area around the perimeter of the borehole (Aurecon 2012).

The groundwater level in the aquifer is expected to recover within one day to one week of drilling, and the impacts on Hanging Swamp vegetation would be negligible. Since there are no Hanging Swamps in the immediate vicinity of Bore 8, with the nearest occurrence located more than 200 m away; there will be no impacts on these swamps from the construction of Bore 8.

The four boreholes at Bore 8 will be fully cased and grouted upon completion of drilling, to ensure that any aquifers are isolated from the future mine workings, and drainage into the workings does not occur during the operation period. The maintenance of groundwater systems in the area of the bores also depends on the integrity of the bore lining. Springvale will therefore maintain the steel/concrete lining

during the life of the Project to eliminate any impact on groundwater systems. This will form part of the normal maintenance regime for the bores.

- Draining of shallow groundwater into mine workings via the boreholes.

Any significant drainage of groundwater from the shallow groundwater table into the mine workings has the potential to interfere with groundwater feed to the shrub swamps that are located in the watercourses on either side of the bore sites. However, the drilling and lining method that will be utilised for the construction of the bores prevents any significant drainage of groundwater from the shallow groundwater system. Therefore no impacts are expected on the shallow groundwater system either during or after construction. It is also noted that even if groundwater was drained from the shallow aquifer through the boreholes, it is highly unlikely that there would be any impact on the shrub swamps as Bore 8 is located down–dip of the major shrub swamps in the area.

- Drainage of deep groundwater into mine workings via the boreholes;

As a large portion of the deep groundwater is drained into the mine opening as a result of the extraction of the longwall panels, the risk of drainage of deep groundwater into mine workings via the boreholes is considered negligible (Aurecon 2012). In addition, the drilling and lining method that will be utilised for the construction of the bores precludes any large scale impacts on the deep groundwater system.

- Contamination of perched and shallow aquifers with drilling fluid.

Drilling fluids will be used to assist in the drilling process at Bore 8, which could lead to a small amount of drilling fluid entering the perched and shallow groundwater systems. However, since the drilling fluids are designed to block the pores in the strata and form a “skin” on the borehole walls, there is normally minimal drilling fluid loss to the strata, unless very open joints or faults are encountered (Aurecon 2012).

Commonly used polymer drilling muds or natural bentonite–based muds, which are not hazardous, will be utilised in the drilling process. These fluids are designed to be used for drilling through water–bearing strata without long–term impact, and have been used in drilling exploration bores at Springvale for many years. The polymer materials used are designed to increase the viscosity of the drilling fluid, and will degrade to water after a period of a few days. The bentonite material is naturally occurring clay and will not enter the pores in the strata, but will form a cake on the borehole wall.

A number of additives may be used during the drilling process. All of the proposed additives in the fluids are commonly used for drilling potable water wells in the Sydney catchment area. Aurecon reviewed the drilling fluid additives in a hazard screening process and none were identified as posing a risk to groundwater quality.

- Additional underground water make and discharge due to groundwater drainage via the boreholes;

The drilling and lining method that will be utilised for the construction of the bores precludes any additional inflow of groundwater to the mine. The risk of any additional underground water make and discharge from the mine due to groundwater drainage via the boreholes is therefore negligible.

- Damage to hanging swamps due to diversion of surface water from disturbed areas;

The Hanging Swamps rely on the infiltration of rainfall to the perched groundwater system as a source of water. Therefore a disruption to this process could result in a change in the recharge to the perched groundwater system, which may have an adverse effect on the swamp vegetation. However, given the relatively small catchment area associated with Bore 8 and the access track, the distance of approximately 200 m to the nearest Hanging Swamp, and that the access track is located along a ridgeline, the risk of damage to any Hanging Swamp community due to diversion of surface water from disturbed areas can be managed by appropriate measures outlined in **Section 7.2.3,** and is considered to be negligible.

Further details of surface water management for Bore 8 and associated access roads are included in **Section 7.11**.

Potential Regional Impacts

Given the low potential for local impacts, the risk of regional impacts as a result of the construction and operation of Bore 8 is considered very unlikely.

Aurecon (2012) concludes that there will be no impact on the aquifer in the shallow groundwater system that is a groundwater source for a large number of the Shrub Swamps in the region. There will also be no connection established between the proposed boreholes at Bore 8 and regionally significant aquifers such as the Clarence Aquifer, which supplies domestic groundwater for the village of Clarence, over 16 km to the southeast. This is because there is no hydraulic connection between this aquifer at Clarence and the same aquifer horizon at Springvale, due to the presence of the valley of Farmers Creek.

Due to the depth and water quality of the aquifers, and the fact that the majority of the area is Newnes State Forest, there are no domestic, industrial or agricultural users of the groundwater resources in these aquifers in the area surrounding Springvale. As the construction and operation of Bore 8 will not affect groundwater resources, there will be no impact on surface water flows that rely to some extent on groundwater feed. Consequently, there will be no impact on Forests NSW assets.

In order to prevent the steel casing of the bores rusting in the long term, and a resulting potential connection between the groundwater systems and the mine workings, upon decommissioning all boreholes will be fully rehabilitated by backfilling with impermeable material, such as concrete to ensure that no leakage occurs. This will prevent the potential for any depletion of groundwater from the perched or shallow groundwater systems into the mine workings, therefore no groundwater dependant ecosystems will be affected.

Increased water make into the underground workings

In addition to the Hydrogeological Impact Assessment conducted by Aurecon (2012), Heritage Computing (2012) undertook an assessment of the potential mine inflows into LW415 to LW419. The report by Heritage Computing is included as Appendix A to Aurecon, 2012 (refer **Appendix G**).

Heritage Computing estimates that the extraction of LW415 to LW419 will further dewater the coal measures resulting in a small increase in the inflows to the mine from about 190 L/s to 200 L/s (totalling approximately 17 ML/day inflow). This estimate was obtained from an empirical model based on goaf perimeter that Springvale currently uses for predicting mine inflows. The capacity of the SDWTS is 30 ML/day and the predicted volumes are therefore well within the capacity of the scheme.

It has been shown that the upper aquifers in the Banks Wall Sandstone are unaffected by mining (Aurecon, 2012), and it is therefore evident that the increased inflows into the mine workings will be derived from the coal measure strata, leading to an increased drawdown area where the coal measures are dewatered. This increased drawdown can extend up to 1200 m from the workings, and continuous pumping in the future may extend this. However, even if the drawdown radius expands, the impact is expected to be minimal, as the water in these lower aquifers represents a negligible contribution to stream flow and vegetation support in the region. This is because their depth and the presence of the Mount York Claystone effectively prevents any significant upwards groundwater flow to local creeks or downwards flow from the important aquifers in the Banks Wall Sandstone.

Aurecon (2012) therefore concludes that there will be no measurable impact on these upper aquifers from the additional inflows due to the proposed extraction of LW415 to LW419, and subsequently, no impacts are anticipated on the swamps that rely on these upper aquifers. In addition, no known groundwater users are located downdip of the Project Application Area that use groundwater from the coal measure strata, and therefore no groundwater users will be impacted upon as a result of the Project.

Cumulative Impacts

Aurecon 2012 concludes that the cumulative impact of the Project from a groundwater perspective, together with the other local activities is regarded to be no different to the impact from the currently approved dewatering operations.

There are a number of other activities and projects in the vicinity of the Bore 8 site that have the potential to impact on the local regional hydrogeology. In addition to the Springvale mine workings, the workings from Clarence and Angus Place Collieries, the ventilation infrastructure associated with these collieries, and forestry and recreational activities all occur within the Newnes Plateau in the locality of the Project Application Area. However, the blind boring method of borehole construction means that the impacts on groundwater during construction and operation will be negligible. The boreholes will be lined and grouted, and any changes in the groundwater level are expected to recover in a short time (less than 1 week) after construction. Therefore, Aurecon (2012) concludes that the Project will not have an impact on other projects identified in the area.

Agricultural activities in the Wolgan River valley may make use of river water, which includes a contribution of groundwater derived from the local strata over Springvale. However the majority of groundwater flow into the Wolgan River comes from the aquifers within the Banks Wall Sandstone, which will not be affected by the installation of Bore 8.

Coal measure groundwater drainage into the bores will also be negligible and will be unaffected by the installation of the boreholes at Bore 8. If any drainage does occur, the drawdown adjacent to the boreholes will extend for significantly shorter distances than the distance to Wolgan River outflow sites, and will be limited to during the construction period, after which lining of the bores will prevent groundwater drainage.

7.2.3 Mitigation Measures

Bore 8 will form part of an existing dewatering network at Springvale. The following mitigation measures will be implemented to ensure the potential risk of impacting local and regional hydrogeology is minimised:

- Blind boring method will be used for construction of the bores, which will reduce groundwater impacts by maintaining the borehole void full of drilling fluids, thereby preventing loss of groundwater into the void;
- The borehole casing will be fully grouted to ensure that there is no drainage of groundwater into the underground workings during the operation period of the dewatering bore;
- Only approved drilling fluids will be used in the borehole construction process;
- The construction footprint for the drill pad and the access track will be minimised to the smallest possible area for the shortest period of time;
- The access track will be constructed to allow run–off to drain naturally to the catchments in the area, so that large volumes of run–off are not directed away from the swamp catchments;
- The access track upgrades will incorporate positive drainage techniques to ensure stormwater flows continue to drain naturally; and
- Appropriate erosion and sediment controls will be implemented for access track and hardstand areas to prevent the offsite discharge of sediment.

7.2.4 Conclusion

With the mitigation measures implemented, the Project is unlikely to have any significant impact on the local or regional hydrogeology.

As discussed in **Section 6.2.2** an application will be submitted to the NOW to transfer the groundwater licence associated with the existing Bore 6 to Bore 8. The current licenced volume attached to Bore 6 is 5,958 ML/year. Based on the daily averages stated above, the extraction limit for Bore 8 will need to be 6,180 ML/year, an increase of 220 ML/year on the limit currently at Bore 6. This proposed increase in volume is an increase of less than 4%, and represents the 95th percentile of recorded flows (the current limit represents the 93.8th percentile).

The additional inflows to Springvale from the extraction of LW415 to LW419 will have a negligible and unmeasurable impact on the local hydrogeological regime, and on surface water flows.

7.3 Bushfire

An assessment of the bushfire risks associated with the construction and operation of Bore 8 in the Newnes State Forest is provided in the sections below.

7.3.1 Existing Environment

The Project Application Area is located on the Newnes Plateau, which has been identified as Bushfire Prone Land (BPL) within the Lithgow LGA. The fire history data from Forests NSW indicate that the majority of bushfires in the area spread from the north and east of Springvale due to the direction of dominant winds throughout the bushfire season. A number of fire trails exist across the Newnes Plateau, with a number in the vicinity of the Project Application Area.

The proposed Bore 8 is located on a broad ridgeline, which during a bushfire would be exposed to uphill fire paths from all directions with exposure to wind turbulence to the northwest, north, northeast and southeast.

7.3.2 Potential Impacts

Given the frequency of bushfires across the Newnes Plateau, the local flora and fauna have adapted to fire, and as such adverse environmental impacts from bushfire are deemed to be low at Springvale (Springvale, 2010). Notwithstanding, bushfire presents an operational risk to the maintenance of mine related infrastructure, included dewatering bores, on the Newnes Plateau.

7.3.3 Mitigation Measures

In recognition of the operational risk noted in **Section 7.3.2** Springvale have established a Bushfire Management Plan (SV–MS–029, Springvale, 2010) and an associated Bushfire Management Procedure in consultation with the NSW Rural Fire Service (RFS). These documents identify both the risks posed by bushfire to Springvale assets, and control strategies to mitigate these risks.

In accordance with the approved Bushfire Management Procedure (Springvale, 2011), Springvale have committed to ensuring that there is an adequate Asset Protection Zone (APZ) around all assets identified in the Bushfire Management Procedure, such as dewatering bores, which are situated on land owned by Springvale Coal and/or land managed/owned by a private or State organisation (i.e. Forests NSW). For all assets with personnel working in them on a regular basis the Bushfire Management Procedure stipulates the fuel load will be reduced down to 10 t/ha or less within 30 m of the asset. For all other assets the fuel load is to be reduced down to 10 t/ha or less within 20 m of the asset.

Accordingly, an APZ will be established around Bore 8. The final operational footprint of the Bore will be approximately 0.32 ha. In accordance with Springvale's Bushfire Management Plan, an APZ with a width of 20 m will be established around the Bore 8 compound. The construction footprint associated with the drill pad, totalling 1.44 ha, was shown to present no constraints in both the ecological and archaeological assessments if clearing were to occur over the entire area. Therefore, upon completion of the construction phase, the area beyond the 0.32 ha compound will be partially rehabilitated, and a 20 m APZ will be maintained around the compound, as illustrated in **Figure 7**. Within this APZ the vegetation will be managed so as to reduce the fuel load, which will involve trimming and clearing some vegetation on an as needs basis. Before any works are carried out a hazard reduction certificate will be obtained from the Lithgow RFS.

Springvale's Bushfire Management Plan and Bushfire Management Procedure have been developed to comply with the provisions stated in the RFS Guideline document *Planning for Bushfire Protection* (2006), which applies to development applications on land that is classified as BPL. This guideline does not apply to Part 3A applications (Clause 2.5), and also has no specific requirements for either mining related infrastructure or the class of development being proposed. However, given that the Project Application Area is located on BPL, the objectives of the guideline have been consulted and applied to the Project in determining appropriate mitigation measures, such as the determination of the appropriate APZ. The objectives, and how they have been applied, are summarised below. Springvale will commit to these objectives.

- *Afford occupants of any building adequate protection from exposure to a bush fire* – The buildings within the Bore 8 compound will not be occupied on a permanent basis. Personnel will only visit the site intermittently for maintenance and inspection purposes;
- *Provide for defendable space to be located around buildings* – An APZ will be established and maintained around Bore 8;
- *Provide appropriate separation between a hazard and building which, in combination with other measures, prevent direct flame contact and material ignition* – The fuel load within the vicinity of Bore 8 will be managed to provide appropriate separation between vegetation and Bore 8;
- *Ensure that safe operational access and egress for emergency service personnel and residents is available* – A 5 m wide access track will be constructed and maintained to Bore 8, and will be available for use by emergency personnel. There are no residents in the area;
- *Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the APZ* – The APZ will be maintained as per the Springvale Bushfire Management Procedure; and
- *Ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting)* – Fire extinguishers will be available at Bore 8.

7.3.4 Conclusion

Given an APZ will be established and maintained, the risk of impact from bushfire on Bore 8 will be minimal.

7.4 Flora and Fauna

RPS was engaged to undertake a flora and fauna assessment for the Project. The purpose of the assessment was to examine the likelihood of the Project significantly impacting on any threatened species, populations or ecological communities within the TSC Act. Assessment was also made with regard to considerations under the EPBC Act.

The key findings and recommendations of the Flora and Fauna Assessment (RPS 2012a) are summarised below. The full report within **Appendix H** should be referred to for further detail.

7.4.1 Existing Environment

RPS (2012a) conducted vegetation mapping, a flora survey, a habitat survey and a fauna survey as part of the Flora and Fauna Assessment to establish the existing ecological environment. Trapping and other intensive survey techniques were not conducted due to the occurrence of extensive previous survey work on the Newnes Plateau by RPS and others.

Vegetation Communities

Four vegetation communities were mapped and confirmed through ground-truthing as occurring within the Study Area defined for the Flora and Fauna Assessment, illustrated in **Figure 8** and listed as follows:

- MU 30 Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland, which occupies a small area of the proposed drill pad location as well as some of the adjacent access track;
- MU 28 Sandstone Plateau and Ridge Scribbly Gum Silvertop Ash Shrubby Woodland, which occupies the majority of the proposed drill pad location as well as an area along the existing access track;
- MU 26 Newnes Plateau Narrow Leaved Peppermint – Silvertop Ash Layered Open Forest is found in several areas along the access track; and
- MU 7 Newnes Plateau Narrow Leaved Peppermint – Mountain Gum – Brown Stringybark Layered Forest occurs along a section of the access track.

The vegetation communities identified within the Study Area are not considered to be commensurate with any TEC listed under the TSC Act or EPBC Act.

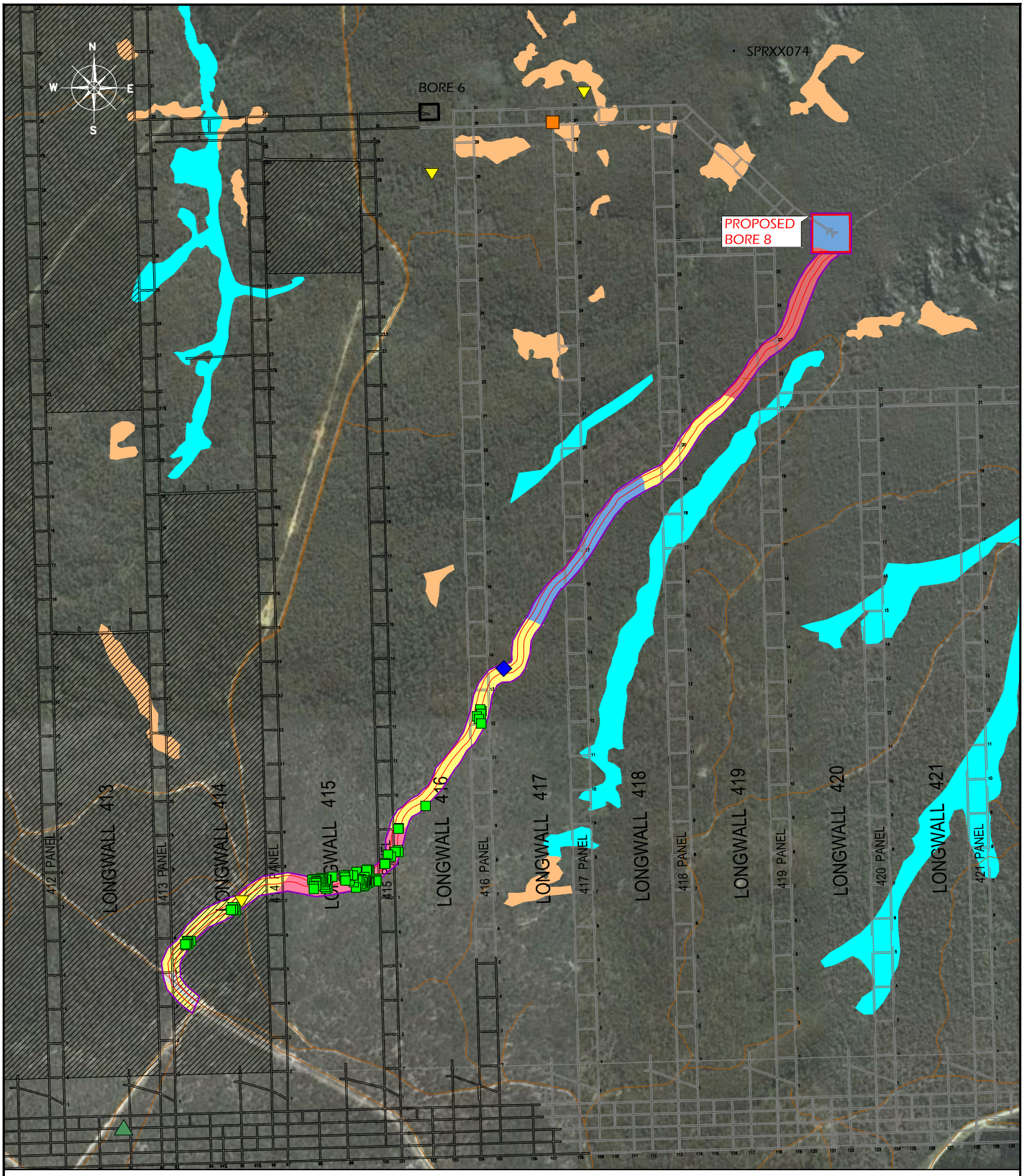
Vegetation mapping in the vicinity of the Study Area has identified several patches of Newnes Plateau Shrub Swamp (MU 50) and Newnes Plateau Hanging Swamp (MU 51) approximately 100 m to 300 m away from the Project Application Area. These communities correspond to the THPSS vegetation community which is listed as a TEC under the EPBC Act.

Further descriptions of the characteristics of the Hanging Swamp and Shrub Swamp vegetation communities can be found in **Appendix H**.

Flora

A list of potentially occurring significant flora within a 10 km radius of the Project Application Area was compiled and included threatened species, populations and ecological communities listed under the TSC Act, those species listed under the EPBC Act, as well as any other species deemed to be of local importance. The list was compiled from database searches comprising the NPWS Atlas of NSW Wildlife and an EPBC Act Protected Matters Search, both undertaken on 22 March 2012.

Table 12 details the threatened flora that was observed in the Study Area, or had the potential to occur within the Study Area.



LEGEND

- Existing Workings
- Future Workings
- Extracted Coal
- Forestry Tracks
- Study Area (Offset for Clarity)
- Project Application Area

Vegetation Communities

- 07 Newnes Plateau Narrow-leaved Peppermint - Mountain Gum - Brown Stringybark Layered Forest
- 26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash layered Open Forest on Ridges
- 28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woddland
- 30 Exposed Blue Mountains Sydney Peppermint - Silvertop Ash Shrubby Woodland
- 62 Cleared and Severely Disturbed Areas
- 51 Newnes Plateau Hanging Swamp
- 50 Newnes Plateau Shrub Swamp

Threatened Flora

- Persoonia hindii

Threatened Fauna

- Scarlet Robin
- Flame Robin
- Gang Gang Cockatoo
- Masked Owl

0 350 700m

Scale 1: 17 500

Base Plan Data Source: Springvale Coal

V:\CCC15-005\Figures\Final\CAD\Fg8_CCC15-005_Ecology_120911.dwg
To be printed A4

Springvale Colliery
Vegetation Communities, Threatened Flora and Fauna

FIGURE 8

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Table 12 – Threatened Flora Known to Occur or Potentially Occurring within the Study Area

Scientific Name	Common Name	TSC Act Status	EPBC Act Status
Acacia flocktoniae	Flockton's Wattle	V	V
Asterolasia elegans		E	E
Boronia deanei	Deane's Boronia	V	V
Caesia parviflora var. minor	Small Pale Grass–lily	E	
Derwentia blakelyi		V	
Eucalyptus pulverulenta	Silver–leafed Gum	V	V
Eucalyptus aggregata	Black Gum	V	–
Eucalyptus cannonii	Capertee Stringybark	V	V
Euphrasia arguta		PD–CE	CE
Galium australe	Tangled Bedstraw	E	–
Genoplesium superbum	Superb Midge Orchid	E	–
Haloragodendron lucasii		E	E
Lastreopsis hispida	Bristly Shield Fern	E	–
Persoonia acerosa	Needle Geebung	V	V
Persoonia hindii		E	–
Persoonia marginata	Clandulla Geebung	V	V
Prasophyllum sp. Wybong	A leek–orchid	–	V
Pultenaea glabra	Smooth Bush–pea	V	V
Thesium australe	Austral Toadflax	V	V
Wollemia nobilis	Wollemi Pine	E	E

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

The targeted surveys conducted resulted in the identification of one threatened flora species, *Persoonia hindii*, which is listed as endangered under the TSC Act, in the Study Area. Several patches of *Persoonia hindii* are present along the existing access track, equating to a total of 1445 individuals in the Study Area. Within the Project Application Area (to be completely disturbed), the *Persoonia hindii* population totalled 93 individuals.

No other threatened flora species, either listed under the TSC Act or EPBC Act, were recorded.

Fauna

As listed in **Table 13**, a total of 46 threatened fauna species and two insect species have been previously recorded with 10 km of the Study Area, or have potential to occur within the Study Area. These species were identified through a review of the NSW Atlas of Wildlife (accessed 22 March 2012), an EPBC Act Protected Matters Search (accessed 22 March 2012), and a review of previous ecological studies undertaken in the locality.

Table 13 – Threatened Fauna Known to Occur or Potentially Occurring within the Study Area

Scientific Name	Common Name	TSC Act	EPBC Act
Birds			
Glossopsitta pusilla	Little Lorikeet	V	–
Anthochaera phrygia	Regent Honeyeater	CE	E
Botaurus poiciloptilus	Australasian Bittern	E	E
Lathamus discolor	Swift Parrot	E	E
Leipoa ocellata	Malleefowl	E	V
Rostratula australis	Australian Painted Snipe	E	V
Calyptorhynchus lathami	Glossy Black Cockatoo	V	–
Callocephalon fimbriatum	Gang Gang Cockatoo	V	–
Stagonopleura guttata	Diamond Firetail	V	–
Ninox strenua	Powerful Owl	V	–
Tyto novaehollandiae	Masked Owl	V	–
Tyto tenebricosa	Sooty Owl	V	–
Ninox connivens	Barking Owl	V	–
Hieraaetus morphnoides	Little Eagle	V	–
Chthonicola sagittata	Speckled Warbler	V	–
Climacteris picumnus	Brown Treecreeper	V	–
Melanodryas cucullata	Hooded Robin	V	–
Petroica phoenicea	Flame Robin	V	–
Petroica boodang	Scarlet Robin	V	–
Daphoenositta chrysoptera	Varied Sittella	V	–
Melithreptus gularis gularis	Black Chinned Honeyeater	V	–
Pomatostomus temporalis	Grey–crowned Babbler	V	–
Mammals			
Dasyurus maculatus	Spotted–tail Quoll	V	E
Petrogale penicillata	Brush–tailed Rock–wallaby	E	–
Pseudomys fumeus	Smokey Mouse	CE	E
Pseudomys novaehollandiae	New Holland Mouse	–	V
Isoodon obesulus obesulus	Southern Brown Bandicoot	E	E
Phascolarctos cinereus	Koala	V	V
Cercartetus nanus	Eastern Pygmy Possum	V	–
Petaurus norfolcensis	Squirrel Glider	V	–
Petaurus australis	Yellow–bellied Glider	V	–
Potorous tridactylus tridactylus	Long Nosed Potoroo	V	V
Pteropus poliocephalus	Grey Headed Flying Fox	V	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	–
Chalinolobus dwyeri	Large–eared Pied Bat	V	V

Scientific Name	Common Name	TSC Act	EPBC Act
Scoteanax rueppellii	Greater Broad Nosed Bat	V	–
Chalinolobus picatus	Little Pied Bat	V	–
Miniopterus schreibersii oceanensis	Eastern–bent Wing Bat	V	–
Saccolaimus flaviventris	Yellow–bellied Sheathtail Bat	V	–
Vespadelus troughtoni	Eastern Cave Bat	V	–
Reptiles			
Eulamprus leuraensis	Blue Mountains Water Skink	V	–
Hoplocephalus bungaroides	Broad Headed Snake	E	V
Varanus rosenbergi	Rosenberg's Monitor	V	–
Amphibians			
Litoria booroolongensis	Booroolong Frog	E	E
Litoria littlejohni	Littlejohn's Tree Frog	V	V
Mixophyes balbus	Stuttering Frog	E	V
Heleioporus australiacus	Giant Burrowing Frog	V	V
Pseudophryne australis	Red–crowned Toadlet	V	–
Invertebrates			
Paralucia spinifera	Bathurst Copper Butterfly	E	V
Petalura gigantea	Giant Dragonfly	E	–

(V) = Vulnerable Species listing
(E) = Endangered Species listing
(CE) = Critically Endangered Species listing

Terrestrial Mammals

No terrestrial mammal species were recorded in the Project Application Area. Whilst several species of macropod have been observed previously within the locality, no threatened terrestrial mammal species were recorded in this assessment. The Study Area however is of sufficient quantity and has the isolation to support the habitat of the Spotted–tail Quoll (*Dasyurus maculatus*). The timber harvesting activities on Newnes Plateau and the occurrence of wildlife disease may limit potential for this species to occur over much of the Study Area.

Arboreal mammals

Arboreal mammal species common to the locality that have been detected during previous surveys include the Greater Glider (*Petauroides volans*), Common Ringtail Possum (*Pseudocheirus peregrinus*) and Common Brushtail Possum (*Trichosurus vulpecula*). There is suitable habitat within the Study Area for smaller gliders such as the Sugar Glider (*Petaurus breviceps*) and the Squirrel Glider (*P. norfolcensis*), listed as Vulnerable under the TSC Act, although these species were not observed by RPS (2012a).

One threatened species, the Eastern Pygmy Possum (*Cercartetus nanus*), which is listed as Vulnerable under the TSC Act and was detected on the Newnes Plateau approximately 1.5 km north of the Study Area during recent RPS's ecological surveys. Similar vegetation communities and high connectivity between the Study Area and those known to be utilised by this species suggests it is likely that the Eastern Pygmy Possum would inhabit the Study Area on either a temporary or permanent basis.

Bats

Several species of microchiropteran bats have been positively identified in the locality through either Anabat echolocation call recordings or physical capture in harp traps. These species include the threatened Large Eared Pied Bat (*Chalinolobus dwyeri*), Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) and Yellow–bellied Sheathtail Bat (Saccolaimus flaviventris). These species are listed as Vulnerable under the TSC Act whilst the Large Eared Pied Bat is also listed as Vulnerable under the EPBC Act.

Avifauna

Common woodland and forest bird species were recorded in the Study Area in addition to two species listed as Vulnerable under the TSC Act; the Scarlet Robin (*Petroica boodang*) and Masked Owl (*Tyto novaehollandiae*) which were identified within the boundaries of the Study Area on both opportunistic bird surveys and previous RPS surveys in the locality.

A number of threatened bird species have previously been identified within 5 km of the Study Area including Gang Gang Cockatoo (*Callocephalon fimbriatum*), Scarlet Robin, Flame Robin, Hooded Robin (*Melanodryas cucullata*) and the Varied Sittella (*Daphoenositta chrysoptera*). The Gang Gang Cockatoo is listed as Vulnerable under the TSC Act and has been identified within 400 m of the Study Area.

No *Allocasuarina* tree species favoured by Glossy Black–Cockatoos were present within vegetation communities within the Study Area.

One threatened forest owl species, the Masked Owl (*Tyto novaehollandiae*), was detected within the Study Area during related ecological surveys by RPS in 2012. Two other species, the Powerful Owl (*Ninox strenua*) and Sooty Owl (*Tyto tenebricosa*) have been previously recorded by RPS within the locality through either visual identification or call playback methods, in late 2011 and early 2012, respectively. The Barking Owl (*Ninox connivens*) has also been previous identified on the Newnes Plateau, with all four owl species being listed as Vulnerable under the TSC Act. RPS (2012a) suggest that the Study Area represents a portion of the local foraging range for these species given the presence or likely presence of small terrestrial and arboreal mammals. However, the quality of the Study Area as habitat for the Powerful Owl (a species that almost exclusively utilises arboreal prey) is potentially reduced due to the low abundance of arboreal prey compared to less disturbed and more productive forests.

Herpetofauna

Herptofauna species identified within the Study Area include the Common Brown Snake (*Pseudonaja textilis*) and Common Death Adder (*Acanthopis antarcticus*).

Targeted and opportunistic searches have been undertaken in the locality during previous RPS surveys for the Blue Mountains Water Skink (*Eulamprus leuraensis*), which is listed as Endangered under both the TSC and the EPBC Acts. However, only two common skink species, related to the Blue Mountains Water Skink, were recorded, namely, the Yellow–bellied Water Skink (*E. heatwolei*) and Eastern Water Skink (*E. quoyii*).

RPS (2012a) recorded common amphibian species including the Common Eastern Froglet (*Crinia signifera*), Eastern Banjo Frog (*Lymnodynastes dumerilli*) and Striped Marsh Frog (*Lymnodynastes peroni*) during nocturnal surveys of the Study Area in 2012. Previous surveys in the locality have recorded the threatened Giant Burrowing Frog (*Heleioporus australiacus*) and the Stuttering Frog (*Mixophyes balbus*).

Insects

Opportunistic searches were made for the Giant Dragonfly and the Bathurst Copper Butterfly, however neither of these species was observed. The Study Area does not occur in proximity to aquatic habitats, and the favoured larval feed plant species of the Bathurst Copper Butterfly, being *Bursaria spinosa*, was not present in the Study Area or observed elsewhere in the locality.

7.4.2 Potential Impacts

Vegetation Communities

Approximately 4 ha of native vegetation will be disturbed for the construction of Bore 8 and the associated infrastructure corridor. Given this clearing represents less than 0.02% of the approximately 25,000 ha of similar habitat that exists on the Newnes Plateau the Project is unlikely to reduce the viability of any ecological communityin the broader locality. No TECs will be cleared for this Project.

The construction works and the operation of Bore 8 will not impact on the surrounding THPSS communities given that these communities are located at distances greater than 100 m from the Project Application Area, and the mitigation measures that will be implemented (refer **Section 7.4.3**).

Threatened Flora

The following threatened flora species were either detected or have the potential to occur within proximity of the Study Area, and therefore RPS (2012a) have assessed the impact on these species:

- *Persoonia acerosa* (Needle Geebung) – not detected during field surveys but has potential to occur within the Study Area due to suitable habitat. However the Project is not likely to have an adverse effect on the life cycle of this species such that a viable local population of the species is placed at risk of extinction;

- *Personnia hindii* – 1,445 individual plants were recorded in the Study Area, with a total of 93 individual plants to be removed in the Project Application Area. Due to the presence of over 12,000 individuals within 2.8 km of the Study Area, the removal of 93 plants (or less than 0.8% of the local population) is not expected to result in a significant impact on the future viability of *Persoonia hindii* in the area;

- *Persoonia marginata* – has potential to occur to be affected by the Project. However this species is not cryptic, and therefore is likely to have been detected during field surveys if present within the Study Area. The Project is unlikely to have an adverse impact on the life cycle of this species such that a viable local population of the species is likely to be places at risk of extinction; and

- *Galium australe* – was not detected during the field surveys, but has the potential to occur within the Study Area. Extensive suitable habitat occurs in the surrounding area, and it is unlikely that this species will be subject to any direct or indirect impacts as a result of the Project therefore an adverse effect on the life cycle is unlikely.

Threatened Fauna

The following threatened fauna species were either detected or have the potential to occur within proximity of the Study Area, and therefore RPS (2012a) have assessed the impact on these species:

- Giant Burrowing Frog (*Heleioprous australiacus*) – not detected within the Study Area during field surveys but has been recorded twice in the vicinity in recent years. Although stream characteristics (running water) are not present in the Study Area, this species has potential to occur during non–

breeding times. The Project is unlikely to have a direct or indirect impact upon a significant amount of habitat provided adequate sediment control measures are implemented and maintained;

- Southern Barred Frog (*Mixophyes bolbus*) – may occur within the Study Area in non–breeding habitat however the Project is unlikely to have a direct or indirect impact upon a significant amount of habitat provided adequate sediment control measures are implemented and maintained;

- Regent Honeyeater (*Anthochaera Phrygia*) – was not detected in the Study Area, but is known to occur in the wider locality and may occur intermittently on the Newnes Plateau. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of potential habitat for this species.

- Gang Gang Cockatoo (*Callocephalon fimbriatum*) – was recorded within the Study Area. The Study Area provides foraging habitat however limited breeding opportunities exist due to the relatively low density of large breeding hollows. Given the relatively small disturbance footprint (4 ha) compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of potential habitat for this species.

- Brown Treecreeper (*Climacteris picumnus victoriae*) – was not detected in the Study Area but has been identified in the locality. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of suitable habitat for this species;

- Varied Sittella (*Daphoenositta chrysoptera*) – has been previously recorded within the Study Area, but the Project is unlikely to significantly affect an area of suitable habitat for this species given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau;

- Little Lorikeet (*Glossopsitta pusilla*) – was not detected in the Study Area but uses surrounding forests and woodlands for foraging purposes on a seasonal basis. Given the relatively small disturbance footprint (3.9 ha) compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of suitable habitat for this species;

- Powerful Owl (*Ninox strenua)* – was not recorded within the Study Area, but it is likely that the Study Area occurs within the foraging range and breeding territory of locally occurring individuals. However the availability of large hollows for breeding is low due to the long history of logging in the area, and disturbance footprint is minor, therefore the Project is unlikely to significantly affect a suitable area of habitat for this species;

- Scarlet Robin (*Petroica boodang*) – was recorded within the Study Area. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of suitable habitat for this species;

- Flame Robin (*Petroica phoenicea*) – was recorded within 1 km of the Study Area therefore likely to utilise the Study Area as part of its forging and or breeding habitat. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of suitable habitat for this species;

- Masked Owl (*Tyto novae hollandiae*) – local individuals utilise the Study Area as a foraging range and breeding territory, and this species was recorded within the Study Area. However due to the

low density of hollow bearing trees due to a long history of logging, along with the relatively small disturbance footprint, the Project is unlikely to affect a significant area of potential habitat;

- Sooty Owl (*Tyto tenebricosa)* – was not recorded within the Study Area, but it is likely that the Study Area occurs within the foraging range and breeding territory of locally occurring individuals. However the availability of large hollows for breeding is low due to the long history of logging in the area, and disturbance footprint is minor, therefore the Project is unlikely to significantly affect a suitable area of habitat for this species;

- Little Eagle (*Heiraaetus morphonoides*) – has been previously recorded within the Newnes State Forest, but was not recorded within the Study Area. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of feeding or roosting habitat for this species;

- Koala (*Phascolarctos cinereus*) – was not recorded within the Study Area. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of feeding or roosting habitat for this species;

- Eastern Pygmy Possum (*Cercartetus nanus*) – has been recorded approximately 1.5 km from the Study Area, but the Project is unlikely to significantly affect an area of suitable habitat for this species given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau;

- Large–eared Pied Bat (*Chalinolobus dwyeri*) – was not recorded within the Study Area. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of feeding or roosting habitat for this species;

- Spotted–tailed Quoll (*Dasyurus maculatus*) – has been recorded on the Newnes Plateau but was not recorded within the Study Area, where potential habitat occurs. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect a suitable area of habitat for this species;

- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) – was recorded within 10 km of the Study Area, where suitable habitat exists. However given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of suitable habitat for this species;

- Eastern Bentwing Bat (*Miniopterus schreibersii subsp. oceanensis*) – was not recorded within the Study Area although potential foraging and roosting habitat occurs within the locality. The likelihood of roosting is low due to the lack of cave structures. The Project is unlikely to significantly affect an area of foraging and roosting habitat for this species given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau;

- Yellow–bellied Glider (*Petaurus australis*) – was not recorded within the Study Area, and the availability of suitable nest sites is low due to the long history of logging in the area. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect a suitable area of habitat for this species;

- Squirrel Glider (*Petaurus norfolcensis*) – was not recorded within the Study Area although suitable habitat occurs within the locality. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect a suitable area of habitat for this species;

- Yellow–bellied Sheathtail–bat (*Saccolaimus flaviventris*) – has been previously recorded within 2 km of the Study Area, with potential foraging and roosting habitat occurring within the locality. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of foraging and roosting habitat for this species; and

- Greater Broad–nosed Bat (*Scoteanax rueppellii*) – was not recorded within the Study Area although potential foraging and roosting habitat occurs within the locality. Given the relatively small disturbance footprint compared to the large, more suitable habitat area of approximately 25,000 ha available nearby on the Newnes Plateau, the Project is unlikely to significantly affect an area of foraging and roosting habitat for this species.

7.4.3 Mitigation Measures

The following mitigation measures, recommended in RPS (2012a) will be implemented to minimise any potential impacts of the Project and the ongoing detrimental impacts upon habitat surrounding the Project Application Area:

- An environmental representative or ecologist will be present during the removal of habitat trees to ensure that the fauna are handled appropriately;

- Any hollow–bearing trees to be removed during clearing activities along with valuable fauna habitat within displaced ground debris will be retained, where practical and feasible, and will be collected for fauna conservation activities off site;

- Populations of *Persoonia hindii* will be avoided, where possible;

- All disturbed areas outside of the access road but within the Project Application Area of Bore 8 will be rehabilitated with endemic native vegetation;

- Adequate erosion and sediment controls will be employed adjacent to all areas of soil disturbance; and

- Appropriate measures will be employed, wherever practical and feasible, to ensure that machinery used in the Project do not bring materials (soils etc.) into the Project Application Area with the potential to infect onsite vegetation with *Phytophthora cinnamomi*, or cause the distribution of weed species.

7.4.4 Conclusion

The Project is unlikely to affect the biodiversity values of the area in the long term since there will be a disturbance of a relatively small area (approximately 4 ha) of native vegetation within the larger 25,000 ha of Newnes Plateau.

Additionally, given adequate mitigation measures described above will be implemented, the Project is not anticipated to have a significant impact on any threatened species, populations or ecological communities listed in the Schedules of the TSC Act or matters of national environmental significance under the EPBC Act.

7.5 Noise and Vibration

SLR was engaged to undertake a Noise and Vibration Impact Assessment for the Project, which is attached as **Appendix I** (SLR, 2012a).

The construction and operation of Bore 8 has the potential to impact upon noise levels in the vicinity. The assessment has been prepared in accordance with the following standards and guidelines, and the outcomes are summarised below:

- Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise;*
- NSW Industrial Noise Policy (EPA, 2000);
- Interim Construction Noise Guideline (DECC, 2009); and
- NSW Road Noise Policy (DECCW, 2011).

7.5.1 Existing Environment

The existing noise environment within the Newnes State Forest is generally limited to noise associated with logging activities undertaken by Forests NSW, along with recreational activities such as four wheel drive pursuits. The wider locality surrounding the Project Application Area is subject to industrial noise from various coal mines, power stations and light industry.

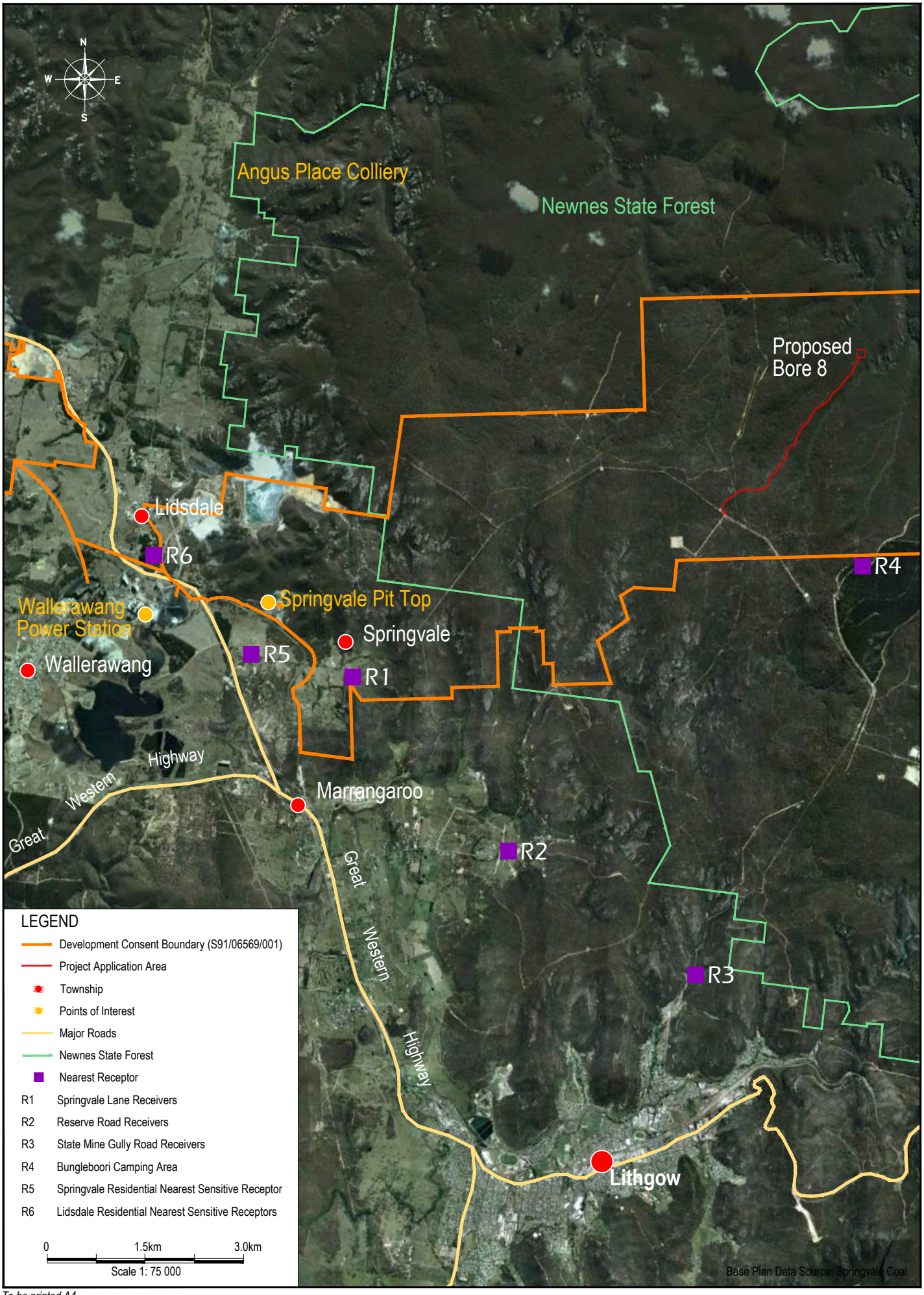
The three nearest residential receivers to the Project Application Area are located over 9 km to the southwest off Springvale Lane, Reserve Road and State Mine Gully Road (identified as R1 to R3 in **Figure 9**). In addition, approximately 3.6 km south of Bore 8 within the Newnes State Forest is the Bungleboori camping area (identified as R4 in **Figure 9**). It is noted that the noise assessment only assesses four of the six receptors identified in **Figure 9**. The additional two were considered relevant for the Air Quality Assessment for reasons outlined in **Section 7.7**.

7.5.2 Assessment Criteria

To model the predicted noise impact during the construction phase, SLR (2012a) separated the activities associated with the Project into the following scenarios:

- Scenario 1 – Establishment of access road and ancillary infrastructure corridor, along with the formation of a level pad for the construction of the bore (including the clearing of vegetation and earthworks);
- Scenario 2 – Drilling four boreholes at Bore 8; and
- Scenario 3 – Civil works for the construction and commissioning of infrastructure at Bore 8.

Using residential criteria in the Interim Construction Noise Guidelines (DECC 2009), construction noise goals for the Project were established and are included in **Table 14**.



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Nearest Sensitive Receptors

FIGURE 9

V:\CCC15-005\Figures\Final\CAD\Fg9_CCC15-005_Nearest Receptors_120911.dwg

Table 14 – Project Specific Construction Noise Goals

Receiver Location	Period	Construction Noise Goal LAeq(15minute)	
		Noise Affected	Highly Noise Affected
R1, R2, R3	Recommended standard hours	40 dBA	75 dBA
	Outside recommended standard hours	35 dBA	
R4	When in Use	60 dBA	

A Rating Background Level (RBL) of 30 dBA was adopted as the criterion for the nearest potentially affected residences during the daytime, evening and night–time periods due to the absence of background noise monitoring.

Full details of how project specific criteria were established can be found in **Appendix I.**

Road Traffic Noise

The *NSW Road Noise Policy* (DECCW 2011) outlines the traffic noise criteria applicable to the Project. The Policy applies different noise limits dependent upon the road category and type of development/land use. **Table 15** contains the applicable criteria for the Project.

Table 15 – Project–Specific Traffic Noise Criteria

Road Category	Development Type / Land Use	Assessment Criteria (dB(A))	
		Day (7 am to 10 pm)	Night (10 pm to 7 am)
Local Roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	LAeq(1 hour) 55 (external)	LAeq(1 hour) 50 (external)

7.5.3 Potential Impacts

Construction Noise

The predicted intrusive LAeq(15 minute) construction noise level for each construction scenario at the nearest potentially affected receivers under calm, prevailing wind and temperature inversion conditions are presented in **Table 16** to **Table 18,** together with the construction noise goals.

Table 16 – Predicted Construction Noise Levels for Scenario 1

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)			Construction Noise Goal LAeq(15minute)	
		Calm	Prevailing Wind	Temperature Inversion	Noise Affected	Highly Noise Affected
R1	Day	<20	N/A	N/A	40	75
R2		<20			40	75
R3		<20			40	75
R4		<20			60	

Table 17 – Predicted Construction Noise Levels for Scenario 2

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)			Construction Noise Goal LAeq(15minute)	
		Calm	Prevailing Wind	Temperature Inversion	Noise Affected	Highly Noise Affected
R1	Day	<20	N/A	N/A	40	75
	Evening	<20	N/A	N/A	35	N/A
	Night	<20	<20	<20	35	N/A
R2	Day	<20	N/A	N/A	40	75
	Evening	<20	N/A	N/A	35	N/A
	Night	<20	<20	<20	35	N/A
R3	Day	<20	N/A	N/A	40	75
	Evening	<20	N/A	N/A	35	N/A
	Night	<20	<20	<20	35	N/A
R4	Day	<20	N/A	N/A	60	
	Evening	<20	N/A	N/A	60	
	Night	<20	<20	<20	60	

Table 18 – Predicted Construction Noise Levels for Scenario 3

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)			Construction Noise Goal LAeq(15minute)	
		Calm	Prevailing Wind	Temperature Inversion	Noise Affected	Highly Noise Affected
R1	Day	<20	N/A	N/A	40	75
R2		<20			40	75
R3		<20			40	75
R4		<20			60	

The predicted construction noise levels are significantly below the respective construction noise goals at the nearest potentially affected receivers and any potential construction noise impacts are considered negligible.

Operational Noise

The results of the operational noise modelling conducted under potential calm, prevailing wind and temperature inversion conditions are included in **Table 19**.

Table 19 – Predicted Operational Noise Levels from Bore 8

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)		
		Calm	Prevailing Wind	Temperature Inversion
R1	Day	<20	N/A	N/A
	Evening	<20	N/A	N/A
	Night	<20	<10	<10
R2	Day	<20	N/A	N/A
	Evening	<20	N/A	N/A
	Night	<20	<10	<10
R3	Day	<20	N/A	N/A
	Evening	<20	N/A	N/A
	Night	<20	<10	<10

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)		
		Calm	Prevailing Wind	Temperature Inversion
R4	Day	<20	N/A	N/A
	Evening	<20	N/A	N/A
	Night	<20	<10	<10

Results of the noise model indicate that the noise levels from operation of Bore 8 will be negligible at all nearest noise sensitive receivers. Such a noise level is highly likely to be inaudible at all receivers and would have a negligible impact on cumulative industrial noise levels at these locations.

Traffic Noise

There will be a minor increase in traffic movements during the approximate six months of construction and commissioning of Bore 8, as discussed in **Section 4.10**. Outside of this period, traffic movements associated with Bore 8 will be limited to the occasional light vehicle trip required for maintenance and inspection purposes only.

Based on a worse case hourly period of eight light vehicle movements and two heavy vehicle movements occurring on the Old Bells Line of Road, the predicted LAeq(1hour) noise level at the nearest receiver (approximately 100 m from the Old Bells Line of Road) is 38 dBA. This is significantly below the 55 dBA criteria detailed in the *NSW Road Noise Policy* (DECCW 2011).

A worse case hourly period on the State Mine Gully Road and associated local roads in Lithgow may result in eight additional light vehicle movements. The noise impact assessment determined the LAeq(1hour) noise level at the nearest roadside receivers (assumed to be approximately 5 m from the edge of the State Mine Gully Road) is 44 dBA. This is significantly below the 55 dBA criteria detailed in the *NSW Road Noise Policy* (DECCW 2011).

Therefore there will not be any additional road traffic noise impacts associated with the construction and operation of Bore 8.

Vibration

The operation of mobile earthmoving equipment such as dozers, excavators, graders, compactors and trucks during the construction phase of Bore 8 is likely to generate vibration.

Vibration levels are however predicted to be negligible and below levels of human perception at the nearest residential receptors, given the minimum separation distance of approximately 9 km from proposed construction activities associated with Bore 8.

7.5.4 Mitigation Measures

Noise modelling undertaken by SLR (2012a) has indicated that the noise emissions from the construction and operation of Bore 8 will have a negligible impact on the nearest sensitive receptors. This is due particularly to the isolated location of the drilling activities, over 9 km from the majority of nearest sensitive receptors, and the fact that any minor impacts will be temporary given the short time frame of six months associated with construction activities.

Notwithstanding the above, all equipment during the construction and operations will be regularly serviced to ensure the sound power levels of each item remains at the default values.

7.5.5 Conclusion

With regards to noise and vibration, the construction and operation of Bore 8 will have negligible impact on the nearest sensitive receptors to the Project Application Area.

7.6 Cultural Heritage

A Cultural Heritage Assessment was undertaken by RPS to assess the potential for impact upon Aboriginal cultural heritage and European heritage as a result of the Project.

The following is a summary of the findings of this report. For further details, the full assessment report should be referred to, which is attached as **Appendix J**.

7.6.1 Existing Environment

Aboriginal Heritage

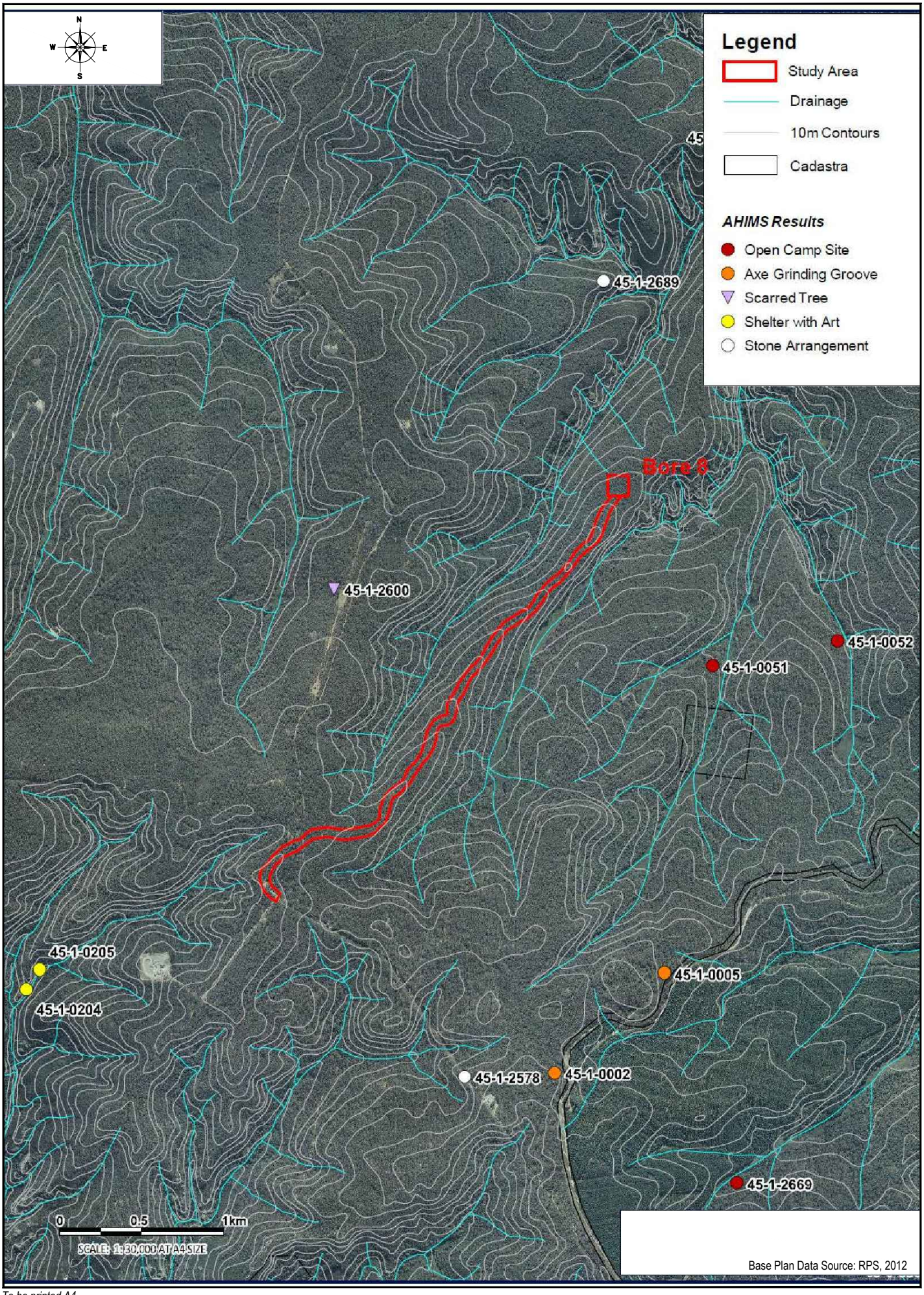
A search of the OEH Aboriginal Heritage Information Management System (AHIMS) on 31 January 2012 conducted by RPS identified a total of 44 Aboriginal sites within a 5 km radius of the Study Area. The common site types identified within this radius are summarised in **Table 20**.

Table 20 – Sites Types Identified within 5 km of the Study Area.

Site Type	Frequency	Percentage
Shelter with deposit	15	34.1
Artefact site	11	25.0
Shelter with art	7	15.9
Axe grinding groove	3	6.8
Scarred tree	2	4.6
Axe grinding grove/shelter with art	2	4.6
Stone arrangement	2	4.6
Axe grinding groove, shelter with deposit	1	2.3
Axe grinding groove, rock engraving, shelter with deposit	1	2.3
Total	**44**	**100**

The nearest recorded sites to Bore 8 are a stone arrangement, located approximately 1.3 km northwest, and two artefact sites (#45–1–0051 and #45–1–0052) approximately 1.7 km to the east, as shown on **Figure 10**. Two shelters with art (#45–1–0204 and #45–1–205) are located approximately 2 km southwest of the junction of the access track with Sunnyside Ridge Road, and a scarred tree site (#45–1–2600) is located approximately 1.5 km to the north of that junction. No sites were identified within the Project Application Area.

A pedestrian survey of the Study Area was undertaken by RPS archaeologist, Deborah Farina, and Aboriginal stakeholders representing Bathurst Local Aboriginal Land Council, Gundungurra Tribal Council Aboriginal Corporation, Wiradjuri Council of Elders, Mingaan Aboriginal Corporation, Warrabinga Native Title Claimants Aboriginal Corporation and North East Wiradjuri Aboriginal Corporation on 12 January 2012. The Study Area was surveyed in accordance with the requirements set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010) in order to inspect the visible ground surfaces, observe exposed soil profiles or other visible features such as rockshelters, scarred trees and art and assess the potential for archaeological deposits.



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Archaeological Sites

FIGURE 10

V:\CCC15-005\Figures\Final\CAD\Fg10_CCC15-005_Archaeological Sites_120911.dwg

No Aboriginal sites were identified during the survey.

It should be noted that the ability to identify sites such as artefact scatters and and/or isolated finds was limited due to heavy vegetation across the Study Area which obscured much of the ground surface. As these sites can be in any landscape, it may be that these types of sites are present within the Study Area, beneath the leaf litter. However, all known artefact scatters in the vicinity of the Study Area are exclusively associated with watercourses, therefore it is plausible that such site types would not be present on Newnes Plateau, even with optimum visibility.

The majority of vegetation in the Study Area is regrowth vegetation and therefore not suitable for the presence of culturally modified trees, even though AHIMS results showed these trees are present in the wider area. Where old growth trees were observed, they were checked for scars and/or carving, particularly in areas where the proposed works would impact upon the vegetation. No culturally modified trees were identified within the Study Area.

European Heritage

The Study Area is wholly located within the bushland of the Newnes Plateau, with the closest European settlement at Lidsdale, approximately 10 km to the west. The closest heritage item identified in the Lithgow Local Environment Plan 1994 is the State Mine Site at State Mine Gully, approximately 12 km to the southwest of the Project Application Area.

A search of the Australian Heritage Database, which includes the Commonwealth Heritage List, The Register of the National Estate and the National Heritage List, determined that no registered national heritage items exist within the vicinity of the Study Area. A search of the NSW Heritage Inventory also showed no heritage items of local importance are listed within the vicinity of the Study Area.

7.6.2 Potential Impacts

As no Aboriginal or European sites were identified, no potential impacts are predicted as a result of the Project.

7.6.3 Mitigation Measures

Whilst no cultural heritage sites were identified in the Study Area, the following measures will be implemented to ensure the risks of any impacts to items of Aboriginal and European Heritage is minimised.

- All relevant Springvale staff will be made aware of their statutory obligations for heritage under the NPW Act and the Heritage Act to be implemented as a heritage induction.

- If during the proposed works any Aboriginal sites are identified in the Project Application Area, then all works in the area will cease, the area will be cordoned off and the OEH will be contacted via the OEH Enviroline 131 555. A suitably qualified archaeologist and the relevant Aboriginal stakeholders will be engaged to allow the sites to be adequately assessed and managed.

- In the unlikely event that skeletal remains are identified, work will cease immediately in the vicinity of the remains and the area will be cordoned off. The NSW Police Coroner will be contacted to determine if the remains are of Aboriginal origin. If determined to be Aboriginal, OEH will be contacted via the OEH Enviroline 131 555. A suitably qualified archaeologist and representatives of the local Aboriginal Community Stakeholders will be engaged to determine an action plan for the management of the skeletal remains, formulate management recommendations and to ascertain when work can recommence.

- If, during the course of the Project, suspected European cultural heritage material is uncovered, work will cease in the area immediately. The NSW Heritage Branch will be notified and works will only recommence when an appropriate and approved management strategy has been instigated.

7.6.4 Conclusion

The survey did not locate any items of Aboriginal or European significance within the Study Area, and as such the Cultural Heritage Assessment concludes there are no constraints to the Project in respect of Aboriginal or European Heritage.

7.7 Air Quality and Greenhouse Gas

SLR was engaged to undertake an Air Quality Assessment (SLR 2012b) for the Project, which is attached as **Appendix K**. The assessment has been prepared in accordance with the following standards, guidelines and models, and the outcomes of the assessment are summarised in the sections below:

- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DECCW, 2005);
- The National Pollutant Inventory Emission Estimation Technique Manual for Mining v3.1 (DSEWPC 2012); and
- US EPA's CALPUFF (Version 6) modelling system.

7.7.1 Existing Environment

Springvale's Pit Top is situated approximately 2 km from the nearest town, Lidsdale, with the proposed location of Bore 8 located approximately 10 km further northeast of the Pit Top. Activities from the existing operations at Springvale that are likely to contribute to the generation of atmospheric pollutants include:

- Crushing and screening of coal;
- ROM stockpiles;
- Storage areas;
- Miscellaneous transfer points (including conveying); and
- Vehicle movements.

Atmospheric pollutants likely to be generated due to these existing activities at Springvale and proposed activities in the Project Application Area include fugitive emissions of particulates (PM_{10}, $PM_{2.5}$ and TSP and deposited dust) in addition to those generated through the combustion of fuel in vehicles (NO_X, SO_2, VOCs, CO, PM_{10}). Any emissions due to fuel combustion in mobile plant will have no significant cumulative impacts in the region and was not considered further in SLR 2012b.

As discussed in **Section 3**, coal bound for export markets is sent to Springvale Coal Services via conveyor for washing in the CPP. Emissions associated with the operations at Springvale Coal Services was not considered within the Air Quality assessment however, due to the large distance (>6 km) from the Springvale Pit Top, and even further from the proposed Bore 8.

Wind roses produced by SLR (2012b) indicate that the region is subjected to predominantly light to moderate winds (between 1.5 m/s and 8 m/s) and that the wind direction is seasonally dependent. The maximum mixing heights predicted by CALMET occur in the mid to late afternoon, due to the dissipation of ground–based temperature inversions and the growth of the convective mixing layer. In addition, a high frequency of conditions typical to Stability Class D and F at Springvale are predicted, which are described as follows:

- Stability Class D is indicative of neutral conditions, conducive to a moderate level of pollutant dispersion due to mechanical mixing; and

- Stability Class F is indicative of stable night time conditions, which will inhibit pollutant dispersion.

As discussed in **Section 7.5.1**, the nearest residential receivers to the Project Application Area are located over 9 km to the southwest off Springvale Lane, Reserve Road and State Mine Gully Road. In addition, approximately 3.6 km south of Bore 8 within the Newnes State Forest is the Bungleboori camping area. The six residential non–project related sensitive receptors (R1 to R6) assessed in SLR (2012a) are illustrated in **Figure 9**. It is noted that the Noise assessment (SLR 2012b) only assesses four of the six receptors identified in **Figure 9**. The additional two were considered relevant for the Air Quality assessment due to their proximity to the Springvale Pit Top.

A number of other industrial facilities located in the vicinity of Springvale contribute to the cumulative impacts on the local airshed; including Wallerawang Power Station, Mount Piper Power stat, the western rail coal unloader, Angus Place Colliery, Lidsdale Siding Coal Loading Facility and Pine Dale Coal Mine. The Wallerawang and Mount Piper Power Stations in particular have a significant impact on the existing air quality in the region.

The predicted cumulative concentrations of pollutants based on the existing environment surrounding the Project Application Area, without the installation and operation of Bore 8, are presented in **Table 21**. These results show that the maximum 24–hour average PM_{10} concentration is predicted to be exceeded at R5 and R6, indicating the 24–hour average PM_{10} criterion is likely to be exceeded even without contribution of the Project.

Table 21 – Predicted Cumulative Background Particulate Concentrations

Receptor	TSP [1] (µg/m^3)	PM_{10} (µg/m^3)		$PM_{2.5}$ [2] (µg/m^3)		Dust Deposition (g/m^2/month)
	Annual Average	Maximum 24–hr Average	Annual Average	Maximum 24–hr Average	Annual Average	Annual Average
R1	36.4	45.4	14.7	2.0	0.17	2.2
R2	35.2	42.0	14.1	1.1	0.06	2.2
R3	34.9	41.9	13.9	0.6	0.03	2.2
R4	35.1	42.6	14.0	0.7	0.04	2.2
R5	39.2	54.6	16.1	4.9	0.45	2.2
R6	53.6	92.2	23.3	11.7	1.84	2.2
Criterion	**90**	**50**	**30**	**25**	**8**	**4**

[1] Regional background TSP concentrations taken to be 2.5 times the monitored regional background PM_{10} concentrations at Bathurst for the year 2008.

[2] No regional background $PM_{2.5}$ concentrations are available, therefore, regional background $PM_{2.5}$ concentrations are not considered.

7.7.2 Potential Impacts

Potential sources of emissions associated with the construction and operation of Bore 8 include heavy and light vehicle movements, vegetation clearing and wind erosion from exposed areas such as the access track and drill pad.

The activities associated with the Project have been separated into construction and operational scenarios as follows:

- Construction Scenario (Scenario 1): This scenario represents the construction of Bore 8 and includes the operations at the Springvale Pit Top, as this will be ongoing during the construction; and

- Operational Scenario (Scenario 2): This scenario represents the normal operations at Springvale. This constitutes the handling and processing of up to 3.4 Mtpa of coal.

Construction Scenario (Scenario 1)

Table 22 presents the annual average TSP concentration predicted by the dispersion modelling undertaken as part of the assessment at each of the nominated sensitive receptors. The results show that the annual average TSP concentrations are predicted to be well below the criterion of 90 µg/m^3 at all identified sensitive receptor locations.

Table 22 – Predicted Annual Average TSP Concentration – Scenario 1 (Construction and Operation)

Receptor ID	Increment	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Lidsdale Siding	Project	Total Background	Total Background + Project
	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
R1	34.5	1.9	<0.1	0.8	36.4	37.2
R2	34.5	0.7	<0.1	0.1	35.2	35.3
R3	34.5	0.4	<0.1	<0.1	34.9	34.9
R4	34.5	0.6	<0.1	0.7	35.1	35.8
R5	34.5	4.6	0.1	2.0	39.2	41.1
R6	34.5	18.6	0.5	0.7	53.6	54.3

Note: Project criterion – 90 µg/m^3 (NSW EPA, 2005)

Table 23 presents the annual average PM_{10} concentration predicted by the dispersion modelling for Scenario 1, which are predicted to be below the criterion of 30 µg/m^3 at all identified sensitive receptor locations.

Table 23 – Predicted Annual Average PM10 Concentration – Scenario 1 (Construction and Operation)

Receptor ID	Increment	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Lidsdale Siding	Project	Total Background	Total Background + Project
	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
R1	13.8	0.9	<0.1	0.3	14.7	14.9
R2	13.8	0.3	<0.1	<0.1	14.1	14.1
R3	13.8	0.2	<0.1	<0.1	13.9	13.9
R4	13.8	0.2	<0.1	0.2	14.0	14.2
R5	13.8	2.3	<0.1	0.6	16.1	16.6
R6	13.8	9.3	0.2	0.2	23.3	23.5

Note: Project criterion – 30 µg/m^3 (NSW EPA, 2005)

With regards to maximum 24 hour average PM_{10} concentration (refer to Table 36 in SLR 2012b (**Appendix K**), the Air Quality Assessment predicted that the criterion of 50 µg/m^3 would be exceeded at two sensitive receptors locations, R5 and R6, during construction of Bore 8. However, upon further investigation it was found that the predicted exceedances are due to the high background 24 hour average PM_{10} concentration, and not due to contributions of the Project.

The predicted annual average $PM_{2.5}$ concentration at R1 to R6 receptors is presented in **Table 24**, and are below the criterion of 8 µg/m^3 at all identified sensitive receptor locations. Furthermore, during

Scenario 1 operations, 24–hour average $PM_{2.5}$ concentration at all identified sensitive receptors is predicted to be well below the criterion of 25 µg/m^3.

Table 24 – Predicted Annual Average PM2.5 Concentration – Scenario 1 (Construction and Operation)

Receptor ID	Increment	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Lidsdale Siding	Project	Total Background	Total Background + Project
	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
R1	ND	0.2	<0.1	<0.1	0.2	0.2
R2	ND	0.1	<0.1	<0.1	0.1	0.1
R3	ND	<0.1	<0.1	<0.1	<0.1	<0.1
R4	ND	<0.1	<0.1	<0.1	<0.1	0.1
R5	ND	0.4	<0.1	0.1	0.4	0.5
R6	ND	1.8	<0.1	<0.1	1.8	1.9

Note: Project criterion – 8 µg/m^3 (Air Quality NEPM, 2003)
ND – No Data

Operational Scenario (Scenario 2)

The predicted annual average TSP, PM_{10} and $PM_{2.5}$ concentrations during general Springvale operations at Bore 8 and the Pit Top are presented in **Tables 25**, **26** and **27**, respectively. The concentrations are predicted to be well below the associated criteria at all identified sensitive receptor locations.

Table 25 – Predicted Annual Average TSP Concentration – Scenario 2 (Operation only)

Receptor ID	Increment	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Lidsdale Siding	Project	Total Background	Total Background + Project
	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
R1	34.5	1.9	<0.1	0.8	36.4	37.2
R2	34.5	0.7	<0.1	0.1	35.2	35.2
R3	34.5	0.4	<0.1	<0.1	34.9	34.9
R4	34.5	0.6	<0.1	<0.1	35.1	35.1
R5	34.5	4.6	0.1	1.9	39.2	41.1
R6	34.5	18.6	0.5	0.7	53.6	54.3

Note: Project criterion – 90 µg/m^3 (NSW EPA, 2005)

Table 26 – Predicted Annual Average PM10 Concentration – Scenario 2 (Operation only)

Receptor ID	Increment	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Lidsdale Siding	Project	Total Background	Total Background + Project
	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
R1	13.8	0.9	<0.1	0.2	14.7	14.9
R2	13.8	0.3	<0.1	<0.1	14.1	14.1
R3	13.8	0.2	<0.1	<0.1	13.9	13.9
R4	13.8	0.2	<0.1	<0.1	14.0	14.0
R5	13.8	2.3	<0.1	0.6	16.1	16.6
R6	13.8	9.3	0.2	0.2	23.3	23.5

Note: Project criterion – 30 µg/m^3 (NSW EPA, 2005)

Table 27 – Predicted Annual Average $PM_{2.5}$ Concentration – Scenario 2 (Operation Only)

Receptor ID	Increment	Increment	Increment	Increment	Cumulative	Cumulative
	Regional Background	Power Station	Lidsdale Siding	Project	Total Background	Total Background + Project
	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
R1	ND	0.2	<0.1	<0.1	0.2	0.2
R2	ND	0.1	<0.1	<0.1	0.1	0.1
R3	ND	<0.1	<0.1	<0.1	<0.1	<0.1
R4	ND	<0.1	<0.1	<0.1	<0.1	<0.1
R5	ND	0.4	<0.1	0.1	0.4	0.5
R6	ND	1.8	<0.1	<0.1	1.8	1.9

Note: Project criterion – 8 µg/m^3 (Air Quality NEPM, 2003)
ND – No Data

As can be seen in **Table 27**, annual average $PM_{2.5}$ concentration is predicted to be below the criterion of 8 µg/m^3 at all identified sensitive receptor locations. Furthermore, 24–hour average $PM_{2.5}$ concentration is predicted to be well below the criterion of 25 µg/m^3 at all identified sensitive receptors.

With regards to maximum 24 hour average PM_{10} concentration, as was the case for Scenario 1, the Air Quality Assessment predicts that the concentration would again exceed the criterion of 50 µg/m^3 at two sensitive receptors locations, R5 and R6 (refer Table 37 in SLR 2012b (**Appendix K**)). However, upon further investigation it was found that the predicted exceedances are due to the high background 24 hour average PM_{10} concentration, and not due to contributions of the Project.

The predicted dust deposition rate data are presented in **Table 28**. The results indicate that incremental and cumulative annual average dust deposition rate at all nominated sensitive receptors are predicted to be well below the respective criterion of 2 g/m^2/month (incremental increase in dust deposition) and 4 g/m^2/month (cumulative dust deposition) during Scenario 1 and Scenario 2.

Table 28 – Predicted Incremental Annual Average Dust Deposition Rate

Receptor ID	Annual Average Dust Deposition Rate (g/m^2/month)				
	Background	Scenario 1		Scenario 2	
		Increment	Cumulative	Increment	Cumulative
R1	2.2	<0.1	2.2	<0.1	2.2
R2	2.2	<0.1	2.2	<0.1	2.2
R3	2.2	<0.1	2.2	<0.1	2.2
R4	2.2	<0.1	2.2	<0.1	2.2
R5	2.2	0.1	2.3	0.1	2.3
R6	2.2	<0.1	2.2	<0.1	2.2

Note: Criteria – 2 g/m^2/month (incremental), 4 g/m^2/month (cumulative) (NSW EPA, 2005)

7.7.3 Mitigation Measures

An Air Quality Assessment undertaken by SLR (2012b) indicates that the impacts from the construction and operation of Bore 8 will have a negligible impact on the nearest sensitive receptors. Notwithstanding, the following activities will continue to be undertaken By Springvale.

- Onsite ambient air quality continuous monitoring will continue to be performed. The ambient air quality monitoring program has been incorporated into a wider environmental monitoring campaign, and includes PM_{10} and TSP concentration measurements using two co–located High Volume Air Samplers.

- Appropriate erosion control techniques in conjunction with dust suppression using water sprays, when required, will be employed in the Project Application Area to reduce particulate emissions arising due to the operation of mobile plant and open areas.

7.7.4 Conclusion

The construction and operation of Bore 8 is unlikely to contribute to any exceedances of relevant air quality criteria for the pollutants assessed.

7.8 Greenhouse Gas

A quantitative GHG Assessment of potential Scope 1, 2 and 3 emissions was undertaken by SLR, and a full copy of the report is attached in **Appendix L**. The assessment has been prepared in accordance with the following standards, guidelines and legislation, and the outcomes are summarised in the sections below:

- National Greenhouse Accounts Factors (DCCEE, 2011);
- Guidelines for Energy Savings Action Plans (DEUS, 2005);
- NGER Act;
- The Centennial Coal Greenhouse Gas Assessment Guidance Notes (Centennial Coal, 2010); and
- Centennial Coal's Climate Change Response Policy.

7.8.1 Existing Environment

The construction and operation of Bore 8 may affect existing GHG emissions from Springvale due to electricity consumption and fuel use. The annual electricity consumption of Bore 8 is estimated to be 11,216,822 kWh. In addition, a backup diesel generator may be used at Bore 8. A similar generator used 17 kL of diesel at Bore 6 in the year 2010 – 2011, and so this level of consumption has been assumed for Bore 8 for the purposes of the GHG assessment. **Table 29** presents the current and proposed activity data relevant to GHG emissions at Springvale.

Table 29 – Summary of Project Related Activity Data Relevant to GHG Emissions (Current and Proposed Operations)

Activity	Current Project Operations	Proposed Project Operations
Annual ROM production (Mt)	3.4 Mtpa	3.4 Mtpa
Annual Electricity Consumption (kWh)	80,442,771	91,659,593
Annual Diesel Consumption (litres) – Springvale Coal	678,583	695,583
Annual Diesel Consumption (litres) – Contractor	914,503	914,503
Annual Fugitive Emissions from Mine Ventilation Shaft (Million m^3)	57,259	57,259
Solid Waste to Landfill (t)	0	0
Liquid Petroleum Gas (LPG) (kg)	47,510	47,510
Petroleum Based Oil/ greases used (L)	203,686	203,686

Note: Values for Contractor Diesel Use, LPG Use and Oils/Grease Use are different to those quoted in "Springvale Vent Shaft, Air Quality and GHG Assessment, November 2011". NGER data was updated since this time following audit.

7.8.2 Potential Impacts

Scope 1: Direct Emissions

Emissions of coal seam CH_4 and CO_2, and the consumption of LPG are not expected to change due to the Project. With regards to direct emissions, the only change anticipated will be as a result of an additional 17,000 L per year of diesel which is expected to be required for the diesel backup generator. The net result is an additional 46 tonnes of CO_{2-e} per annum of direct (Scope 1) emissions associated with the Project.

Scope 2: Indirect Emissions through the Consumption of Purchased Electricity

Electricity consumption at Springvale has been calculated as approximately 64.8 Megawatt–hours (MWh), with a total of 3.7 MWh attributable to current electric ventilation fan operations and 10.6 MWh attributable to the dewatering bore operations. The operation of Bore 8 will result in an increase of 9,983 tonnes of CO2–e per annum of indirect (Scope 2) emissions due to additional electricity consumption.

Scope 3: Other Indirect Emissions

Reductions in the emissions of GHG resulting from the extraction and transport of fossil fuels for use in electricity production or onsite diesel combustion are beyond the control of Springvale, and as such Springvale has a restricted capacity to reduce their GHG emissions under Scope 3. It is estimated that the operation of Bore 8 may increase indirect (Scope 3) emissions due to diesel usage by 1,910 tonnes of CO_{2-e} per year.

A summary of the GHG emissions associated with the current approved operations at Springvale, and the addition of Bore 8, are presented in **Table 30**.

Table 30 – Summary of GHG Emissions Attributable to the Project (Current Operations and Proposed Upgrade)

Emission Source	Emissions (t CO_2–e / annum						Total (t CO_2–e)	
	Scope 1		Scope 2		Scope 3		Scope 1 + Scope 2 + Scope 3	
	Project (Bore 8)	Current Operations	Project (Bore 8)	Current Operations	Project (Bore 8)	Current Operations	Project (Bore 8)	Current Operations
Fugitive Emissions	–	20,076	–	–	–	–	–	20,076
Diesel	46	4,274	–	–	3.5	327	49.5	4,601
LPG	–	129	–	–	–	–	–	129
Oils and Greases	–	220	–	–	–	–	–	220
Electricity	–	–	9,983	71,594	1,907	13,675	11,890	85,269
Coal Combustion	–	–	–	–	–	808,242	–	808,242
Total	**46**	**24,699**	**9,983**	**71,594**	**1,910.5**	**822,244**	**11,939.5**	**918,537**

As can be seen in **Table 30**, the installation and operation of Bore 8 is anticipated to contribute an additional 11,939 t $CO_{2–e}$ per annum (Scope 1, 2 and 3). When compared to the current site operations, this represents an increase of 1.3% in GHG emissions. Total Scope 1 GHG emissions from Springvale, including Bore 8, would therefore represent less than 0.02% of total NSW 2009 emissions and approximately 0.004 % of total Australian 2009 emissions. More specifically, an increase of 46 tonnes $CO_{2–e}$ per annum of Scope 1 emissions due to the Project would represent less than 0.00003% of total NSW emissions and 0.0000008% of Australian 2009 emissions.

7.8.3 Mitigation Measures

Given the negligible impact of the Project, no further mitigation measures with regards to GHG emissions are required.

7.9 Waste Management

7.9.1 Existing Environment

Details of the existing waste management system at Springvale are included in **Section 3.9**. In summary, the following waste streams are produced and managed:

- Coarse Rejects – which are transported via haul truck to the REAs (Huon and 'A Pit') located at Springvale Coal Services, or used as part of general operations;

- Fine Rejects – are fed to the Co–disposal Dam at Springvale Coal Services via slurry pipes and discharged into retention dams for either reuse in the CPP or disposed off–site in accordance with licence conditions. The fines may be dried and blended into product coal for both domestic and export markets.

- General Waste – disposal in accordance with Springvale's Waste Management Plan. Paper products and waste oils are recycled off site, with non–recyclable waste disposed by licensed waste contractors to a landfill.

7.9.2 Potential Impacts

Waste generated by the construction and operation of Bore 8 will include a low volume of general waste, along with fines, fluids, lubricants and waste oils associated with the drilling process.

7.9.3 Mitigation Measures

Springvale will undertake the following mitigation measures to manage waste generated from the Project, and to ensure there are no significant impacts associated with waste disposal:

- Contractors/employees will keep all work areas maintained and in a neat orderly manner. The use of segregated litter bins, regular maintenance and site inductions shall prevent the accumulation of litter on site.
- Chemicals, waste oils and lubricants will be collected in appropriate containers for safe transport to the Pit Top disposal area for reuse, recycling or disposal.
- General waste and other waste materials from construction activities will be disposed of appropriately, using licensed contractors as required and including transfer into the Springvale Pit Top waste collection system for disposal in accordance with the Waste Management Plan.
- An appropriately sized sediment basin will be constructed at the Bore 8 location to capture dirty water from disturbed areas during the construction phase. The fines that settle out within this sediment basin will be temporarily stockpiled within the cleared area for subsequent use in rehabilitation activities.
- An appropriately sized sump with appropriate erosion and sediment controls will be constructed at the Bore 8 location to capture (and store for reuse) all drilling fluid from borehole drilling activities. The drilling fluid will be reused during the construction phase, and on completion of drilling activities, will be pumped out by a licensed contractor for disposal at an appropriate facility.
- The drilling fluid to be used for the drilling activity will be biodegradable.
- The following measures relating to the sump maintenance will be undertaken:
    - the sump water level will not be allowed to exceed 50% sump capacity for a period greater than 48 hours;
    - the sump will be inspected regularly to monitor water level and to check for any erosion of sump walls and seepage of water from the sump;
    - the erosion and sediment controls associated with the sump will be regularly checked and maintained if required.
- Material contaminated by hydrocarbon spills will be disposed of using appropriate procedures.

7.10 Traffic and Transport

The construction and operation of Bore 8 will result in minor traffic movements within the Newnes State Forest. Although the risk is considered low, the impact of the Project on traffic and transport within the area has been assessed in the following sections.

7.10.1 Existing Environment

The Project Application Area is located within the Newnes State Forest. There are numerous access tracks and fire trails that traverse the Newnes State Forest, which are utilised by Forests NSW during its logging activities, and RFS for fire fighting purposes. The access tracks are also enjoyed by recreational users for bushwalking, cycling and four wheel drive pursuits.

Springvale uses and maintains all forestry access roads and tracks utilised by Springvale in accordance with the Forest Practices Code (Part 4 – Forest Roads and Fire Trails) (DTIRIS) and the maintenance agreement in place between Springvale Coal and Forests NSW. Existing use of the access tracks on the Newnes Plateau is currently undertaken for the purposes of environmental monitoring, subsidence monitoring above existing mine workings and to access the existing ancillary infrastructure for maintenance.

Springvale visually inspects the condition of access roads and fire trails it utilises within the Newnes State Forest in accordance with the approved Roads Management Plan (Springvale Coal, 2006).

7.10.2 Potential Impacts

Heavy vehicles will access Bore 8 via the Old Bells Line of Road at the Zig Zag Railway located in the village of Clarence. Light vehicles will access Bore 8 by either the Old Bells Line of Road from Clarence or via the State Mine Gully Road from Lithgow. Both routes converge with final access to Bore 8 site via the access track off Sunnyside Ridge Road (refer **Figure 2**) in the Newnes State Forest.

During the construction and commissioning stages of Bore 8, it is estimated that approximately four heavy vehicles and four light vehicles will travel to the bore site each day. These vehicle movements will be temporary, with the construction/commissioning phases expected to last approximately six months. Once operational, traffic movements associated with Bore 8 will be minimal, with the occasional light vehicle trip required for maintenance and inspection purposes only. Inspections will be carried out in accordance with the approved Springvale Road Management Plan. Minor traffic movements associated with the transfer of diesel generators and fuel to Bore 8 will also occur when necessary.

7.10.3 Mitigation Measures

The following measures will mitigate the impact of the minimal traffic associated with the Project:

- Springvale will notify Forests NSW of the heavy vehicle movements in the Newnes State Forest prior to the commencement of the construction activities to ensure operators and contractors involved with any logging activities within the vicinity of the Project Application Area will be aware of the heavy vehicle presence on Newnes Plateau.

- The continued inspections of access roads in accordance with the Road Management Plan to ensure any minor impacts to the condition of the roads due to the heavy vehicle movements are identified and remediated.

7.10.4 Conclusion

Given that the vehicle trips associated with the construction and commissioning phase of the Project are minimal and will only be required for six months, and that vehicle movements during operation of Bore 8 will be limited to the occasional light vehicle trip required for inspection and maintenance purposes only, no significant traffic related impacts are anticipated as a result of the Project. In addition the Noise and Vibration Assessment (refer **Section 7.5**) found that there will be no noise impacts relating to traffic as a result of the Project.

7.11 Surface Water

A Surface Water Assessment (GSSE 2012) has been prepared to determine the potential surface water impacts of the Project.

A review of the site water balance was originally put forward to the DP&I as a consideration in the EA. Upon further consideration of the Project and refinement of the Project scope, a review of the site water balance was deemed not necessary since there will be no changes to the relevant aspects of water management or water use at Springvale as a result of the Project. The water extracted from Bore 8, which will subsequently replace the existing Bore 6, will continue to be managed as per existing arrangements and sent to the Wallerawang Power Station via the SDWTS. No changes are proposed to existing surface water management or surface infrastructure facilities at the Springvale Pit Top.

An assessment of potential hydrogeological impacts relating to the construction and operation of Bore 8 was conducted by Aurecon (2012) (refer **Section 7.2**), including an assessment of mine dewatering rates. The Surface Water Assessment therefore does not address hydrogeological considerations or the mine water make, however provides information on the management of clean and dirty water, along with erosion and sediment controls for the construction and operational phases of Bore 8.

A copy of the full Surface Water Assessment (GSSE, 2012) is included in **Appendix L**, and summarised below.

7.11.1 Existing Environment

The Study Area straddles the divide between the upper catchment of the Wolgan River and the catchment of the Coxs River. The Wolgan River flows in a north north–westerly direction and is a tributary of the Capertee River, which ultimately joins the Colo River, the Hawkesbury River and Broken Bay.

The Coxs River flows in a southerly direction and is a sub–catchment of the greater Warragamba Dam Catchment. The Warragamba Dam Catchment lies within the catchment for Sydney's water supply.

The Springvale lease area is characterised by a dendritic drainage network, which comprises tributaries of the following river and creek systems:

- Coxs River;
- Wolgan River (eastern and western branches);
- Marrangaroo Creek; and
- Kangaroo Creek.

Bore 8 is located in the headwaters of the Carne Creek catchment, a sub–catchment of the Wolgan River catchment. No watercourse is intersected by the proposed alignment of Bore 8 access track or drill pad.

Standard controls for unsealed roads are present on the existing fire trails; cross banks and mitre drains are spaced according to track gradient, shedding runoff into the shoulder vegetation. These controls appear to be effective, with no evidence of significant scouring on the track surface or sedimentation in the adjacent vegetation observed during the site inspection conducted by GSSE in May 2012.

7.11.2 Potential Impacts

Construction Phase

Activities with the potential to impact on surface waters during construction of the Project include the following:

- Initial site establishment;
- Vegetation clearing;
- Topsoil stripping and stockpiling;
- Earthworks to construct the access track and borehole platform;
- Construction of water management structures (e.g. mitres and diversion drains); and
- Vehicle and equipment movements during construction.

Potential impacts of these activities may include:

- Elevated sediment loads and turbidity in surface water flows;
- Chemical and/or hydrocarbon contamination of soils and receiving waters; and
- Changes in water flows reporting to sub-catchments of the nearby THPSS communities.

Operational Phase

Activities with the potential to impact on surface waters during the operational phase are:

- Operation of Bore 8 pumping infrastructure;
- Water pipeline operation and maintenance; and
- Vehicle and equipment movements during operation.

Potential impacts of these activities may include:

- Elevated sediment loads and turbidity in surface water flows; and
- Chemical and / or hydrocarbon contamination of soils and receiving waters.

Decommissioning and Rehabilitation Phase

Potential impacts on surface water resources described above are also anticipated to apply to the decommissioning and rehabilitation phases of the Project. Management and mitigation measures described in **Section 7.11.3** will be maintained throughout the decommissioning and rehabilitation process. These measures will not be discontinued in any disturbed areas until rehabilitation performance criteria have been achieved.

7.11.3 Mitigation Measures

Specific measures to manage and mitigate potential impacts to surface water in the construction phase will be developed in a Construction Environmental Management Plan for the Project.

The key mitigation measures recommended are as follows:

- Timber cleared in the construction footprint will be stockpiled downslope of the construction footprint to form a sheared timber windrow sediment trap;

- Sediment fences will be installed on the contour downslope of the construction footprint within the drill pad and the sump;

- Access tracks will be constructed in accordance with *The Blue Book: Vol. 2C unsealed roads* (DECC, 2008);

- Earthworks associated with trenching the proposed water pipeline and electricity infrastructure will be conducted in accordance with *The Blue Book: Vol. 2A installation of services* (DECC, 2008);

- The access track and services corridor will be graded with a crown to shed water in accordance with recommendations for unsealed roads constructed on a ridge top, as outlined in *The Blue Book: Vol. 2C unsealed roads* (DECC, 2008);

- A sediment basin, sized in accordance with Blue Book requirements and detailed in the Surface Water Assessment (GSSE, 2012), will be constructed on the downslope side of the Bore 8 drill pad and the sump. Dirty water diversions will be installed to ensure that runoff from the drill pad, the sump and other disturbed areas is directed into the sediment basin;

- A clean water diversion will be constructed upstream of the drill pad to divert clean water around the construction area and reduce the amount of dirty water runoff to be treated within the sediment basin;

- Cross banks and mitre drains will be constructed at appropriate intervals to convey surface water runoff away from the road alignment;

- A temporary bund will be constructed around the diesel tank brought to the Bore 8 site on a temporary basis to contain an accidental spill and prevent surface runoff from the area; and

- Spill kits for the management of hydrocarbon and other chemical spills will be available at the site. All relevant personnel will be provided toolbox talks on the use of the spill kits and management of accidental spills.

7.11.4 Conclusion

The Surface Water Assessment (GSSE, 2012) concludes that there will be minimal impacts on the surface water flows and water quality of downstream receiving water as a result of the Project if the mitigation measures noted in **Section 7.11.3** are implemented. In particular, negligible impacts are expected on the local THPSS communities (Hanging Swamps and Shrub Swamps) given the large distance of greater than 100 m of the Project Application Area from the occurrences of the THPSS communities.

7.12 Rehabilitation and Closure

7.12.1 Rehabilitation Objectives and Outcomes

The rehabilitation objectives for the Project are as follows:

- Decommissioning – remove all items of infrastructure at the Bore drill pad including buildings, pipelines, the submersible pumps, all fencing and the gate;

- Landform establishment – stabilise all disturbed areas and create a final landform that blends with the surrounding topography and is safe and free-draining; and

- Revegetation – establish native vegetation with the species diversity commensurate with the surrounding vegetation and an end land use of open forest.

The key outcomes of the rehabilitation activities are as follows:

- A safe and self-sustaining final landform with natural drainage lines;
- Successful revegetation of disturbed areas; and
- Successful integration of the rehabilitated areas with surrounding areas of existing vegetation.

7.12.2 Rehabilitation Procedures

Dewatering Bores

Upon completion of construction and commissioning of Bore 8, the drill pad will be partially rehabilitated to the minimum area required for the operational phase, anticipated to be a 0.32 ha platform, and a 20 m wide APZ around the final drill pad footprint. Disturbed areas will be rehabilitated to a land use commensurate to that existing before construction of Bore 8 (i.e. open forest). The APZ will be managed as a defendable space, and as such will only partially be rehabilitated during operation of Bore 8. So whilst the ultimate end land use will be open forest, during operation of the bore, the fuel load within the APZ (refer **Figure 7**) will be kept reduced.

The partial rehabilitation activities will involve the following:

- Temporary facilities and equipment associated with drilling activities will be removed;
- Available disturbed areas will be dozer trimmed to facilitate the appropriate drainage of surface runoff and to ensure the final landform is commensurate with the surrounding topography. The area will then be de–compacted as necessary by ripping along the contour; and
- Any leaf litter and cleared topsoil removed during the construction phase will be spread back over the disturbed area to aid regeneration. Topsoiled areas will be contour ripped to create a 'key' between the soil and the underlying subsoil, thereby increasing infiltration.

The area will then be direct seeded with species to achieve a final land use of open forest, using endemic native vegetation where possible. The seed will be sourced from local provenance or a local commercial seed supplier, also where possible. Bore 8 will be a semi–permanent feature in the landscape until the infrastructure is no longer required for the management of mine inflows at safe levels for Springvale's underground mining activities. Bore 8 will then be decommissioned. Following decommissioning, full rehabilitation of the disturbed areas will be undertaken in accordance with the Occupation Permit, and to Forest NSW's standard and satisfaction. All surface infrastructure associated with Bore 8 will be removed. The boreholes will be cut off below ground level, grouted and sealed in accordance with DRE requirements to prevent long term changes to water chemistry of the groundwater aquifers. The area will then be trimmed, ripped and seeded as per the rehabilitation activities described in the dot points above. The proposed rehabilitation works will ensure that the final landform is stable and non–polluting, and mimics the near-original landform for an end land use of open forest.

Adequate erosion and sediment controls will be implemented during all rehabilitation works, to ensure sediment is contained within the disturbed area. These controls would be maintained on an ongoing basis until such time that the success of the revegetation activities has been demonstrated.

The rehabilitation of Bores 5 and 6 will be undertaken in the same manner as described for Bore 8. However, the rehabilitation of Bore 5 will commence when Bore 8 becomes operational, while the rehabilitation of Bore 6 will commence when Bore 8 is decommissioned.

Access Track

During construction of Bore 8 and ancillary infrastructure a combined access track and infrastructure corridor of approximately 10 m in width will be created. Partial rehabilitation of the infrastructure corridor will commence soon after the power cables and pipelines have been trenched underground. The areas of the access track that will be rehabilitated comprise all disturbed areas outside of the final upgraded 5 m wide access track to Bore 8. Any topsoil removed during construction will be respread and the disturbed areas will be ripped and re-seeded, using endemic grass species where possible.

Following the decommissioning and the drill pad of Bore 8, the upgraded access track will remain for use as a fire trail.

Springvale Pit Top

No change is proposed to the rehabilitation of the Pit Top area, Springvale Coal Services and associated infrastructure, which will be undertaken in accordance with the approved MOP upon closure of Springvale.

7.12.3 Rehabilitation Performance Criteria and Monitoring Strategy

Table 31 lists the performance criteria and monitoring strategy for all rehabilitation works that will be undertaken.

Table 31 – Rehabilitation Performance Criteria and Monitoring Strategy

Rehabilitation Objective	Performance Indicator	Monitoring Strategy
Decommissioning	• All infrastructure has been removed from the drill pad. • Boreholes have been sealed.	• AEMR includes photographic evidence of the decommissioned Bore 8 site.
Landform establishment	• The landform created at the drill pad site morphology blends in with the surrounding landscape. • The re-profiled area does not represent an erosion hazard. • The land capability of the rehabilitated areas is similar to the current land capability (refer **Section 7.14.1**). • The final landform is free-draining, and erosion and sediment controls are maintained.	• AEMR includes up to date survey of final landform. • Quarterly visual inspection by appropriately trained personnel.
Revegetation	• The disturbance area has been revegetated with endemic native vegetation, where appropriate. • Noxious weeds are not competing with the revegetated areas with native plants and grass cover.	• Monthly visual inspection by appropriately trained personnel for six months after completion of rehabilitation. • Annual visual inspection by appropriately trained personnel after six months.

7.13 Visual Amenity

Although the risk of the Project impacting visual amenity was considered low, a brief assessment of the potential impacts of the construction and operation of Bore 8 has been undertaken, and is summarised in the sub–sections below.

7.13.1 Existing Environment

The Project Application Area is located within the Newnes State Forest which, as noted previously covers approximately 25,000 ha in remnant vegetation and pine plantation. Forests NSW selectively log the vegetation for timber. However, expansive native vegetation exists on Newnes Plateau and in the vicinity of the Project Application Area.

The Newnes State Forest also supports a number of recreational land uses, with activities dependent of natural landscape qualities. Users of the area for recreational purposes include bushwalkers, cyclists, photographers and motorists.

The nearest residence to the Bore 8 site is over 9 km away.

7.13.2 Potential Impacts

Due to the small amount of clearing associated with the Project (4 ha) there will be minimal impact on the visual landscape within the wider Newnes State Forest. Any visual impact will be temporary, as the infrastructure will only be a semi–permanent feature in the landscape, with decommissioning and rehabilitation of Bore 8 to take place once the infrastructure is no longer required.

There are no permanent visual receptors in the vicinity of the Study Area therefore any potential visual impact will be restricted to the temporary visitors (recreational users, contractors, mine personnel) to Newnes Plateau. However, the likelihood that non-project related visitors frequent this isolated area of the Newnes State Forest is considered to be low, especially as there are minimal existing infrastructure in the general locality of Bore 8 that will require onerous scheduled servicing.

The construction and commissioning phase is anticipated to take approximately six months, after which progressive rehabilitation will be undertaken to reduce the disturbance footprint of Bore 8 to 0.32 ha Once operational, the Bore 8 site will resemble the Bore 6 site (**Plate 1**) which is currently in operation within the Newnes State Forest. The existing native vegetation surrounding Bore 8 will screen the infrastructure from any potential temporary sensitive receptors that may be in the vicinity.

Visual stray light is not anticipated to pose any potentially adverse environmental impacts during the construction or operation of Bore 8 due to the locality, surrounding vegetation and the distance to neighbouring properties.

Following completion of drilling, rehabilitation will be undertaken as soon as practical. The already minimal visual impact that Bore 8 may impose will therefore be reduced further upon completion of construction.

7.13.3 Mitigation Measures

The potential impacts on visual amenity as a result of the Project are anticipated to be minimal. Notwithstanding, the following measures will further ensure there is minimal impact on the visual amenity of the surrounding area.

- Progressive rehabilitation of Bore 8 will be undertaken whereby partial rehabilitation will be undertaken following construction and drilling, and full rehabilitation will be undertaken following decommissioning when Bore 8 is no longer required.

- Following decommissioning of Bore 8, all infrastructure will be removed and the entire platform will be rehabilitated to the satisfaction of Forests NSW in accordance with the Occupation Permit.

- Use of buildings and items of infrastructure made out of non–reflective material and in colours that blend in with the surrounding vegetation. In this regard, Springvale will continue to use green colourbond buildings currently used at the Bore 6 facility (refer **Plate 1**).

- Waste generated and stored at the Bore 8 facility will be properly managed such that no litter dispersal from within the Project Application Area will occur.

- The proposal for the nominated end land use of open forest will ensure negligible visual impact in the long term.

7.13.4 Conclusion

The proposed bore 8 is located approximately 9 km from the nearest sensitive residential location. The existing native vegetation will screen the infrastructure from any potential temporary sensitive receptors that may be in the vicinity. Visual stray light is not anticipated to pose any potentially adverse environmental impacts due to the distance to neighbouring properties. It is therefore considered that the impact on the visual landscape as a result of the Project will be negligible.

7.14 Soils, Land Capability and Agricultural Suitability

A desktop study of existing soil and landscape information was undertaken to classify and determine the soil landscapes and the likely soil types within the Study Area, identify rural land capability and agricultural suitability classifications and identify any potentially impacts on soil material which may pose high environmental risks if disturbed.

7.14.1 Existing Environment

Soil Landscape Units

As shown in **Figure 11**, three soil landscape units underpin the Study Area: Newnes Plateau; Wollangambe and Medlow Bath as delineated by the Soil Landscapes of the Wallerawang 1:100,000 Sheet (King 1993).

Surface soils within the Newnes Plateau Soil Landscape consist of acidic shallow sands and clayey sands overlying sandy clay loams and friable sandstone. Soils within the Wollangambe Soil Landscape consist of sands, loamy sands, and clayey sands overlaying shallow to deep sandstone or occasional sandy clay to clay subsoils. The soils with the Medlow Bath Soil Landscape consist of moderately deep stoney and acidic earthy sands and yellow earths.

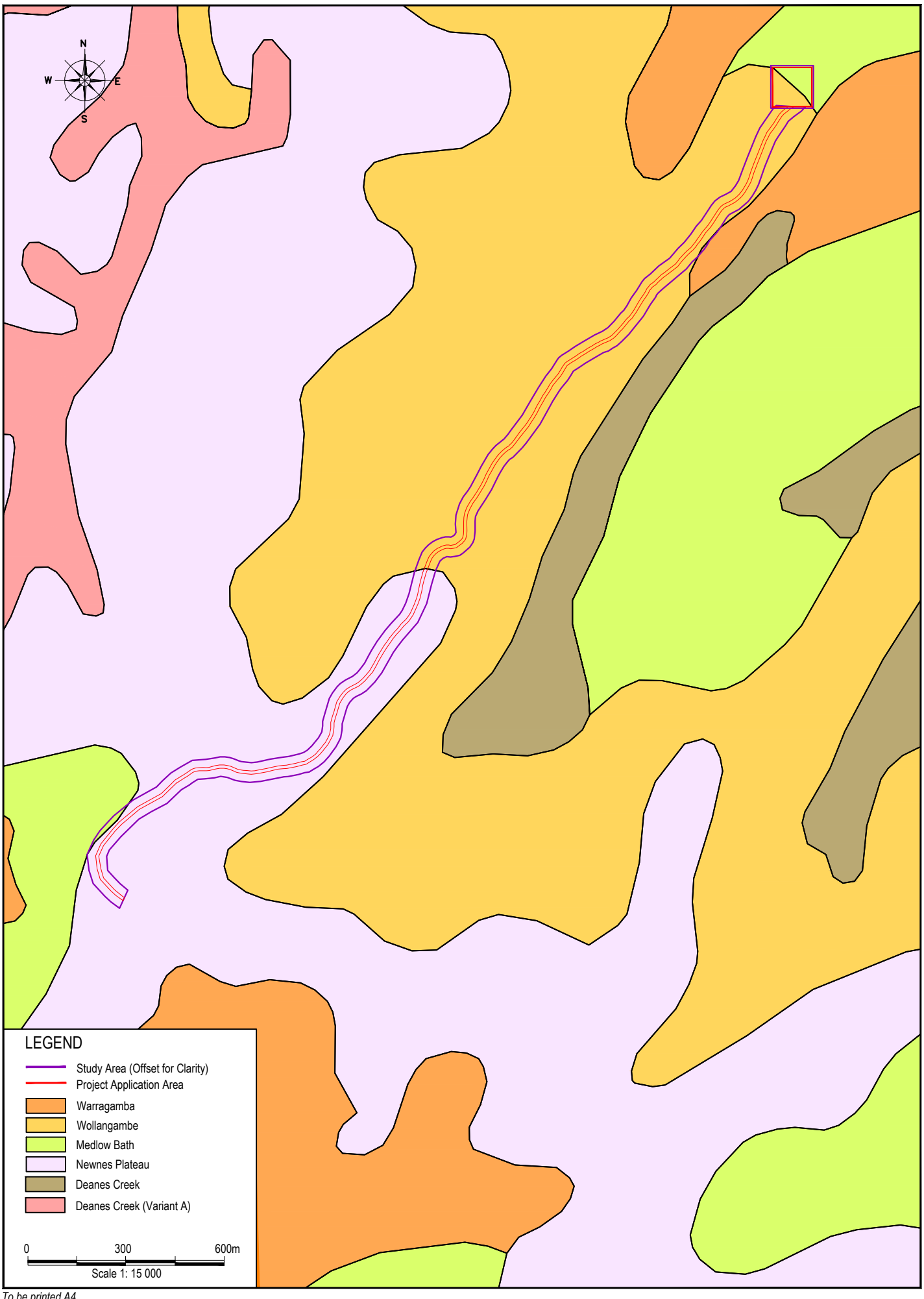
Land Capability

The land capability assessment of the Study Area was conducted in accordance with the DTIRIS rural land capability classification system. The system consists of eight classes, which classify land on the basis of an increasing soil erosion hazard and decreasing versatility of use. It recognises the following three types of land uses:

- Land suitable for cultivation;

- Land suitable for grazing; and

- Land not suitable for rural production.



To be printed A4

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

Springvale Colliery
Soil Landscapes

FIGURE 11

V:\CCC15-005\Figures\Final\CAD\Fg11_CCC15-005_Soil Landscapes_120816.dwg

The method of land capability assessment takes into account a range of factors including climate, soils, geology, geomorphology, soil erosion, topography, and the effects of past land uses. The classification does not necessarily reflect the existing land use; rather it indicates the potential of the land for uses such as crop production, pasture improvement and grazing.

The system allows for land to be allocated into eight possible classes (with land capability decreasing progressively from Class I to Class VIII). The classes are described in **Table 32**.

Table 32 – Rural Land Capability Classes

Land Class	Land Suitability	Land Definition
I	Regular Cultivation	No erosion control requirements
II	Regular Cultivation	Simple requirements such as crop rotation and minor strategic works
III	Regular Cultivation	Intensive soil conservation measures required such contour banks and waterways
IV	Grazing, occasional cultivation	Simple practices such as stock control and fertiliser application
V	Grazing, occasional cultivation	Intensive soil conservation measures required such contour ripping and banks
VI	Grazing only	Managed to ensure ground cover is maintained
VII	Unsuitable for rural production	Green timber maintained to control erosion
VIII	Unsuitable for rural production	Should not be cleared, logged or grazed

Source: Emery KA (1986) Soil Conservation Service of NSW

The Newnes State Forest has a special zoning classification of 'State Forest'. However, for the purposes of this assessment, the rural land capability of the Study Area typically reflects Class VI and Class VII land. Class VI land, due to its low soil fertility, is limited to grazing only with management practices in place to ensure ground cover is maintained. Class VII land is land which, owing to its high soil erosion hazard and severe site limitations should remain under green timber. It generally has severe to very severe site limitations for other land uses, but may be suitable for timber production.

Agricultural Suitability

The agricultural suitability assessment of the Study Area was conducted in accordance with the DTIRIS agricultural suitability classification system. The system consists of five classes, providing a ranking of lands according to their productivity for a wide range of agricultural activities with the objective of determining the potential for vegetative growth within certain limits.

The classification is based upon the effects of climate, topography and soil characteristics, the cultural and physical requirements for various crops and pastures, and existing socio–economic factors including local infrastructure and geographic location. These factors combine to determine the productive potential of the land and its capacity to produce crops, pastures and livestock. The classes are described in **Table 33**.

Table 33 – Agricultural Suitability Classification System

Class	Agricultural Suitability	Land Definition
1	Highly productive land suited to both row and field crops	Arable land suitable for intensive cultivation where constraints to sustained high levels of agricultural production are minor or absent.

Class	Agricultural Suitability	Land Definition
2	Highly productive land suited to both row and field crops	Arable land suitable for regular cultivation for crops but not suited to continuous cultivation. It has a moderate to high suitability for agriculture but edaphic (soil factors) or environmental constraints reduce the overall level of production and may limit the cropping phase to a rotation with sown pastures.
3	Moderately productive lands suited to improved pasture and to cropping within a pasture rotation	Grazing land or land well suited to pasture improvement. It may be cultivated or cropped in rotation with pasture. The overall level of production is moderate as a result of edaphic or environmental constraints. Erosion hazard or soil structural breakdown limit the frequency of ground disturbance, and conservation or drainage works may be required.
4	Marginal lands not suitable for cultivation and with a low to very low productivity for grazing	Land suitable for grazing but not for cultivation. Agriculture is based on native or improved pastures established using minimum tillage. Production may be high seasonally but the overall level of production is low as a result of a number of major constraints, both environmental and edaphic.
5	Marginal lands not suitable for cultivation and with a low to very low productivity for grazing	Land unsuitable for agriculture or at best suited only to light grazing. Agricultural production is very low or zero as a result of severe constraints, including economic factors, which preclude improvement.

Source: NSW Agriculture & Fisheries (1990)

The agricultural suitability classification of the Study Area consists of Class 4 and Class 5 agricultural suitability. Class 4 and Class 5 lands are marginal lands not suitable for cultivation and with a low to very low productivity for grazing.

7.14.2 Potential Impacts

The impact of establishing the construction footprint on the agricultural suitability of the Study Area and locality will be negligible given that the pre–disturbance agricultural suitability is marginal and not suitable for cultivation or grazing.

Potential Acid Generating Soils

The potential for further acid generation from the soils following exposure to aerobic conditions is very low. Acid Sulfate Soils (ASS), which are the main cause of acid generation within the soil mantle, are commonly found less than 5 m above sea level, particularly in low–lying coastal areas such as mangroves, salt marshes, floodplains, swamps, wetlands, estuaries, and brackish or tidal lakes. There has been little history of acid generation from soil material in the Central West Region, and ASS are not anticipated in the Project Application Area given it is approximately 1000 m above sea level.

Erosion

The proposed land use for the Study Area following decommissioning of Bore 8 is State Forest. The Project is not expected to permanently impact land capability or agricultural suitability given the minor extent and nature of the disturbance.

The following disturbance activities pose a risk of accelerating natural erosion processes:

- Vegetation clearing within the Project Application Area;
- Access track upgrade works; and
- Construction works within the drill pad.

This mechanical disturbance of the topsoil and underlying subsoil may temporarily reduce the ability of the soil to resist the dislodgement of particles from raindrop impact and surface water flow during rainfall events, and also more susceptible to wind erosion.

However, given the relatively small disturbance footprint (approximately 4 ha, of which 2.34 ha will be partly rehabilitated), there will be no adverse effects to the Study Area or surrounding land, provided appropriate mitigation measures are implemented (refer **Section 7.14.3**).

7.14.3 Mitigation Measures

Erosion control structures will be erected prior to any clearing of vegetation, soil stripping or the construction of access roads, as outlined in **Section 7.11**.

During the construction phase of the dewatering bore and access track the natural topsoil, where present, will be stripped and stockpiled for use in rehabilitation following completion of construction.

7.15 Agricultural Impact

The potential impacts on agricultural resources or industries associated with Project are described in this section. The term 'agricultural resource' is used to describe the land on which agriculture is dependent and the associated water resources (quality and quantity) that are linked to that land.

This section has been prepared in accordance with the *Guidelines for Agricultural Impact Statements* (DP&I 2012).

7.15.1 Existing Environment

Agricultural History

Whilst the Lithgow area was established on coal mining, steel manufacturing and other industrial enterprises, the grazing of cattle and sheep, along with some cropping for grain production have been carried out in the region since the 1830s. There are records of flour milling from locally grown wheat as far back as 1837, and later in 1857 a wool mill was developed to produce tweed from locally sourced wool. The wool mill operation continued for 115 years, ceasing operation in 1972. Grazing and some cropping still occurs within the Lithgow LGA, though it is not the dominant source of employment or earnings when compared to surrounding districts (Lithgow Tourism 2012).

The Project Application Area may have experienced minor forestry activities in conjunction with the coal mining industry since early settlement. However, it is assumed that given the terrain and soils within the area, very little other agricultural activity has occurred in the immediate vicinity of the Project Application Area.

Agricultural Support Infrastructure

There is limited agricultural support infrastructure in the Lithgow LGA. There are a number of rural merchandise and agricultural supply businesses; however the nearest livestock selling centre is located approximately 52 km away, outside of the Lithgow LGA. Grain production is of little consequence in the area and there are no grain delivery sites in the Lithgow LGA.

Agricultural Enterprises

The Central Tablelands, incorporating the Lithgow LGA, hosts a timber industry with $525 million in output, $226 million in gross regional product, $91 million in household income and almost 2,000 full–time equivalent jobs (Lithgow City Council Strategic Plan, 2007). The forests are not only a source of timber but provide a range of recreational vehicle activities.

The forestry resources overlying the Project Application Area are managed by Forests NSW. Mobile forestry crews are located within the surrounding locality and can be mobilised to work in the Project Application Area if deemed feasible.

In the broad regional context, agriculture is a contributor to the local economy but not to the extent of other surrounding regions. Of the land suited to agriculture within the Lithgow LGA only 1.4% (2,945 ha) is capable of sustaining regular cultivation. Only 64% (134,563 ha) of the land zoned Rural General - Zone No 1(a) (210,357 ha), in the Lithgow LGA is capable of sustaining regular agricultural production such as sheep or cattle grazing. There is a bias towards cattle and to a lesser extent sheep grazing for agricultural enterprises in the Lithgow LGA (Lithgow City Council Strategic Plan 2007).

There are no traditional agricultural enterprises such as sheep and cattle grazing within the Project Application Area or the immediate surrounds.

Agricultural Production Value

Forest NSW has advised that a small volume of sawlogs can be salvaged from the roadside during clearance associated with the Project. Preliminary estimates provided by Forests NSW indicate that the forestry resource in the Project Application Area is approximately 5 m³ per annum of sawlogs and other products. With a current value of about $80/m³ which would imply a rental of $400/hectare/year (Forests NSW 2012).

Agriculture is a contributor to the local economy with approximately 33% of land within the LGA suitable for agricultural production. The total value of agricultural production to the Lithgow LGA is considered low.

The average value of agriculture (livestock and cropping activities) within the agriculturally capable land in the LGA in 2006 was calculated at $135 per hectare, giving a total estimated agriculture production value of $18.23 million for the Lithgow LGA. This low value per hectare figure and smaller holding size suggests that many agricultural enterprises are reliant on off–farm income (LCC 2007).

Agricultural Employment

According to the 2006 Australian Bureau of Statistics, Census of Population and Housing there are only 263 employees in the agriculture, forestry and fishing sector in the Lithgow LGA. Whilst forestry jobs exist within the surrounding locality, no specific agricultural jobs are based within the Project Application Area.

Rural Land Classification

There is no land considered Strategic Agricultural Land within the Project Application Area. The draft strategic land use plan for the Lithgow region has not been released and therefore no biophysical or industry cluster maps have been developed, however the soil assessment has demonstrated that the Project Application Area is not considered highly valuable agricultural land. The Project Application Area does not meet the requirements of fertility, land capability and water resources for Strategic Agricultural Land, nor is it located within an area of critical industry cluster.

7.15.2 Potential Impacts

The Project Application Area is not currently used for any traditional agricultural purposes such as grazing or cropping. However, the bushland located within the Project Application Area is managed and used by Forests NSW as part of a forestry enterprise, with a land capability of class VI and class VII.

Forests NSW have indicated they will assess the proposed disturbance area to determine the value of sawlogs, pulp wood and fire wood and will extract any valuable timber prior to the construction phase. Given the proposed activities of Forests NSW to extract timber prior to the construction phase the risk of impact to agricultural (forestry) production is negligible.

There are no other agricultural enterprises within the Project Application Area or immediate locality. Therefore, the impact from the Project on agricultural enterprises, support services, processing and value adding agricultural industries is negligible.

The findings from the Surface Water Assessment (GSSE 2012) conclude that there would be no change in the site's water balance due to the Project. This conclusion results in a negligible risk of impacts on water resources allocated to agricultural enterprises or production levels as a result of the Project. There is no groundwater extraction points used for agriculture within the Project Application Area or immediate surrounding locality, and therefore the Project would have negligible impact of agricultural groundwater users.

No agricultural based enterprises are reliant on the visual or landscape character of the Project Application Area. There is no tourism infrastructure in the local or regional area, upon which agricultural enterprises are reliant, that would be impacted by the Project. No changes to employment numbers in the agricultural sector are predicted as a result of the Project.

Bore 8 is a temporary facility in the landscape, and therefore no land will be permanently removed from agriculture. The Project Application Area will be temporarily removed from agricultural uses during the Project life, however it is anticipated that this land could be suitable for forestry activities following decommissioning and rehabilitation activities.

During the operation phase of the project, a rental for the site (including site access roads) that compensates Forests NSW for the loss of timber production potential may be established. Preliminary estimates provided by Forests NSW indicate that the forestry resource in the Project Application Area is approximately 5 m³ per annum of sawlogs and other products. With a current value of about $80/m³, this would imply a rental of $400/hectare/year (Forests NSW 2012).

7.15.3 Mitigation Measures

Given the negligible impacts associated with the Project on agricultural resources, the following mitigation measures will be implemented to ensure potential impacts on agricultural resources or industries associated with the Project will be minimal.

- Bore 8 will be rehabilitated upon decommissioning to the satisfaction of Forests NSW; and
- Forests NSW will be consulted further prior to commencement of clearing activities associated with the construction of Bore 8 and associated access track, to ascertain whether any harvestable timber will be removed.

7.16 Socio–Economic Impacts

Bore 8 will from a critical part of Springvale's existing dewatering system, thus enabling the continuation of approved mining operations at Springvale, and the associated ongoing employment and flow–on socio–economic benefits.

The following socio-economic impacts, actual or perceived, could result from the Project.

- That the local community are not adequately informed of the activities associated with the Project;
- That Springvale may not implement local purchasing practices; and
- That disturbed areas within the Project Application Area are not successfully rehabilitated upon decommissioning of the Bore 8 dewatering facility.

The Project will implement mitigation measures to minimise potential socio-economic impacts as follows.

- Springvale will continue to engage in regular dialogue with the local community and provide regular updates on its website. The existing community complaints line will be maintained.

- Springvale will give preference, where practicable and cost-competitive, to suppliers of equipment, services or consumables located within the local community.

- Springvale will continue to contribute donations and in-kind support to local community groups.

- Springvale will properly rehabilitate the disturbed areas on decommissioning in accordance with the rehabilitation objectives, performance indicators and monitoring strategy presented in **Table 31**.

In addition to these mitigation measures, as demonstrated by this EA the impacts on the nearest sensitive receptors are anticipated to be negligible. Assessment of the potential socio-economic impacts therefore demonstrates that the beneficial effects of the Project far outweigh any minor adverse impacts associated with the proposed activities.

7.17 Cumulative Impacts

The contribution of the Project to cumulative effects in the locality along with existing/approved projects and activities on the Newnes Plateau has been considered in preparation of the EA. The environmental assessment has shown that the Project poses negligible environmental impacts, however the potential for contribution to cumulative effects has been considered, given the presence of a number of mining–related activities on the Newnes Plateau.

Activities located in the vicinity of the Project Application Area which contribute, or have the potential to contribute, to cumulative impacts in the locality include the following:

- Mining – related activities located on the Newnes Plateau from Angus Place Colliery and Springvale such as dewatering bores, powerlines, ventilation shafts and exploration activities;

- Other industries in the village of Clarence including coal mining e.g. Centennial Clarence Colliery, sand mining e.g. Newnes Kaolin Sands Project;

- Forestry activities, including native vegetation and pine plantation logging; and

- Recreational activities on the Newnes Plateau including campers, day visitors, and motorised vehicles.

The Project has the potential to contribute to cumulative effects on aspects including flora and fauna, water resources, air quality, greenhouse gas, noise and visual amenity.

With regards to air quality and noise related impacts, the assessment carried out as part of the EA concluded that construction and operation of Bore 8 would not result in any exceedances of criteria at sensitive receptor locations. As such the Project poses negligible impacts relating to air and noise and therefore would not contribute to cumulative impacts at sensitive receivers. This is due in particular to the isolated nature of the Project, as well as the short timeframe associated with construction. In addition, there will not be any additional road traffic noise impacts associated with the construction and operation of Bore 8. Similarly, groundwater and surface water impacts from the Project are predicted to be negligible and are therefore unlikely to contribute to any cumulative impacts on water resources in the locality. The contribution of the Project to greenhouse gas emissions is also very minor, with the Project only contributing a 1.3% increase in total Scope 1, 2 and 3 GHG emissions from Springvale.

In relation to flora and fauna and visual amenity, the Project will result in the disturbance of 4 ha of vegetation; however 2.34 ha will be rehabilitated following the completion of construction of Bore 8. The very small nature of disturbance associated with the Project is insignificant compared to the extensive

contiguous areas (approximately 25,000 ha) of similar vegetation and habitat present on the Newnes Plateau, and as such the contribution of the Project to cumulative effects on flora and fauna in the locality will not be significant. The small amount of disturbance and temporary nature of the Project also means that the cumulative impact on the visual landscape will be negligible.

In addition, given that the impacts at a local level on the Newnes Plateau are anticipated to be negligible, it follows that the contribution of the Project to impacts at a regional level will be insignificant.

8.0 DRAFT STATEMENT OF COMMITMENTS

Table 34 presents a compilation of the actions identified in **Section 7.0** that will be implemented at Springvale, in additional to those already in place, in order to effectively monitor, mitigate and/or manage the potential environmental and socio–economic impacts of the Project should it be approved.

Table 34 – Statement of Commitments

Item	Commitment
Groundwater	• The borehole casing will be fully grouted to prevent contamination of groundwater between aquifers intercepted. • Only approved drilling fluids will be used in the borehole installation process.
Bushfire	• An Asset Protection Zone will be established and maintained around the Bore 8, in which the fuel load will be managed to 10 t/ha. • The Asset Protection Zone will be approximately 20 m in width around the final footprint of Bore 8.
Ecology	• An environmental representative or ecologist will be present during the removal of habitat trees to ensure that fauna are handled appropriately. • Where feasible, any hollow–bearing trees removed by clearing activities along with valuable fauna habitat within displaced ground debris will be retained and collected for fauna conservation activities off site. • Populations of the threatened species *Persoonia hindii* will be avoided, where possible. • Respreading of topsoil and organic matter will allow natural regeneration to occur in disturbed areas. • Adequate sediment control will be employed adjacent to all areas of soil disturbance. • Appropriate vehicle hygiene protocols will be employed to ensure that machinery does not bring soil materials onto the project application area.
Aboriginal and European Heritage	• All relevant Springvale staff will be made aware of their statutory obligations for heritage under *National Parks and Wildlife Act 1974* and the *Heritage Act 1977* which may be implemented as a heritage induction. • If during the proposed works any Aboriginal sites are identified, all works in the area will cease, and legislated action will be undertaken. • If skeletal remains are identified, work will cease immediately in the vicinity of the remains and the area cordoned off. Legislated action will then be implemented. • If suspected European cultural heritage material is uncovered, work will cease in that area immediately. The NSW Heritage Branch will be notified.
Air Quality	• Appropriate dust suppression control techniques will be employed to reduce dust emissions arising from the operation of mobile plant and open areas.
Waste Management	• Contractors/employees will keep all work areas in a neat orderly manner. • Chemicals, waste oils and lubricants will be collected in appropriate containers for safe transport to the Pit Top disposal area for reuse, recycling or disposal. • Drilling fluid to be used for the drilling activity will be biodegradable. • An appropriately sized sump with appropriate erosion and sediment controls will be constructed. The drilling fluid will be reused and on completion of drilling activities will be pumped out by a licensed contractor for disposal at an appropriate facility. • The sump water level will not be allowed to exceed 50% sump capacity for a period greater than 48 hours. • The sump and the associated erosion and sediment controls will be inspected regularly and maintained if required.

Item	Commitment
Traffic and Transport	• Springvale will notify Forests NSW of the heavy vehicle movements in the Newnes State Forest prior to the commencement of the construction activities. • Inspections of access roads in accordance with the Road Management Plan will continue to ensure any minor impacts to the condition of the roads are identified and remediated.
Surface Water	• A Construction Environmental Management Plan will be developed prior to commencement of construction works. • Appropriate sediment and erosion controls in accordance with the Blue Book (Landcom, 2004 and DECC, 2008) will be installed and maintained around disturbed areas. • Earthworks associated with the access track and trenching the water pipeline and electricity infrastructure will be conducted and graded to a crown to shed water in accordance with the Blue Book. • A sediment basin will be constructed on the downslope side of the Bore 8 drill pad, and dirty water diversions put in place to ensure that runoff from the drill pad is directed into the sediment basin. • A clean water diversion will be constructed upstream of the drill pad to divert clean water around the construction area and reduce the amount of dirty water runoff to be treated. • Cross banks and mitre drains will be constructed at appropriate intervals to convey runoff away from the road alignment. • Hydrocarbon and other chemical spills will be managed appropriately.
Rehabilitation	• Partial rehabilitation will be undertaken following construction and drilling, and full rehabilitation will be undertaken following decommissioning. • All infrastructure will be removed, the bores cut off below ground level, grouted and sealed, and the entire platform rehabilitated to the satisfaction of Forests NSW in accordance with the Occupation Permit upon decommissioning. • Upon decommissioning all disturbed areas will be trimmed, ripped and seeded to achieve a final land use of open forest. • Adequate sediment controls will be implemented during all rehabilitation works.
Visual Amenity	• Building and items of infrastructure will be constructed using non–reflective material and in colours that blend in with the surrounding vegetation.
Soil, Land Capability and Agricultural Suitability	• Temporary erosion control structures will be erected prior to any clearing of vegetation, soil stripping or the construction of access roads. • Topsoil, where present, will be stripped and stockpiled for use in rehabilitation following completion of construction.
Agricultural Impact	• Forests NSW will be consulted further prior to commencement of clearing activities to ascertain whether any harvestable timber will be removed.

9.0 PROJECT JUSTIFICATION AND ALTERNATIVES

9.1 Project Justification

Springvale has been operating a mine dewatering system for a number of years to ensure water levels in the mine can be safely kept at manageable levels as underground coal extraction progresses. Springvale currently uses two hydrogeological models, an empirical model based on the dependence of measured pumping data and the goaf perimeter and a numerical model developed by the CSIRO, to predict mine in–flows. Data from these models predict that mine in–flows will increase as the mine progresses to the east of the existing workings. In order to satisfy Springvale's future dewatering requirements to ensure a safe underground operation an additional dewatering facility will be required. Bore 8 will therefore form a critical part of Springvale's dewatering strategy, allowing the safe extraction of coal from the already approved LW416 to LW419. The proposed Bore 8 will be comparable with the existing dewatering bore (Bore 6) on Newnes Plateau.

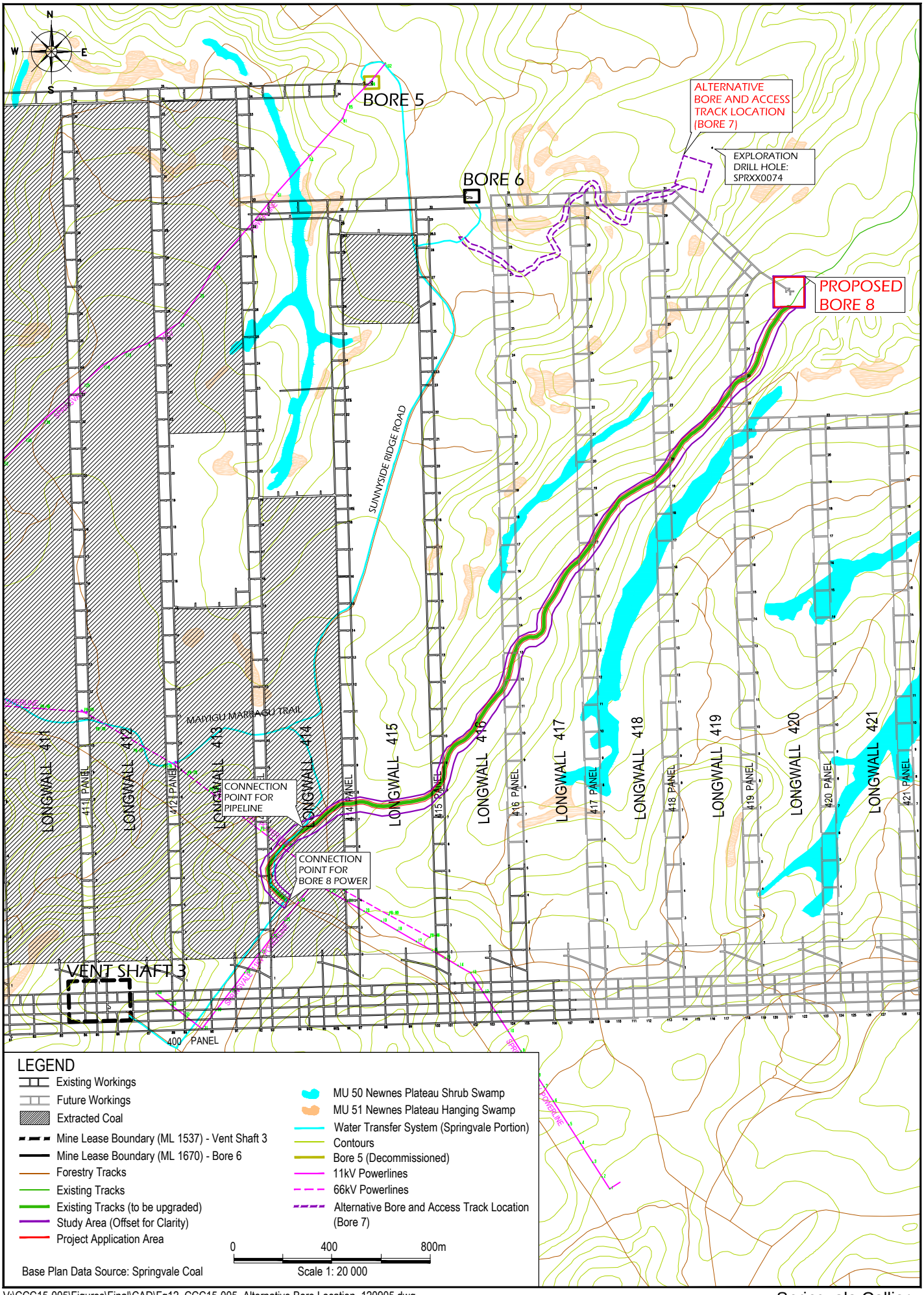
The environmental impacts of the construction and operation of Bore 8 assessed in this EA through a wide range of specialist studies have shown the Project poses negligible impacts. A 'Do Nothing' option or not proceeding with the Project involves not constructing the Bore 8 dewatering facility. This has the potential of posing safety and operational risks resulting in the closure of Springvale, and a resulting loss of employment to the existing site personnel, as well as decreased export earnings for Centennial and reduced government revenue.

9.2 Alternatives Considered

An alternative location for the additional dewatering facility (known as Bore 7) was considered by Springvale, and is illustrated in **Figure 12**. The Bore 7 location, on the Newnes Plateau northwest of Bore 8, was however rejected due to the following reasons:

- The unfavourable underground geological conditions; and
- Occurrences of Hanging Swamps, an EEC listed under the EPBC Act, within approximately 10 m of a section of the existing access track to the Bore 7 location.

The nearest location of a Hanging Swamp community to the Project Application Area associated with Bore 8 is however greater than 200 m away, and is therefore a more favourable option with regards to avoiding the swamp communities. The Bore 8 location was therefore deemed a more feasible location for the additional dewatering facility due to better environmental conditions, as well as geological conditions.



V:\CCC15-005\Figures\Final\CAD\Fg12_CCC15-005_Alternative Bore Location_120905.dwg
To be printed A4

Springvale Colliery
Alternative Bore Location (Bore 7)

FIGURE 12

GSS ENVIRONMENTAL
Environmental, Land and Project Management Consultants

10.0 CONCLUSION

This EA has been prepared to support an application by Springvale seeking a modification to development consent S91/06569/001 pursuant to Section 75W of the EP&A Act to allow for the construction and operation of an additional dewatering facility (Bore 8) and ancillary infrastructure on the Newnes Plateau. Ancillary infrastructure required includes a water transfer pipeline and electricity infrastructure, which will be buried alongside the access track to Bore 8 in a services corridor.

Bore 8 will consist of four dewatering holes, installed with submersible pumps, and will form a critical part of Springvale's dewatering strategy, allowing the safe extraction of coal from the already approved LW416 to LW419, and will be comparable with other dewatering bores drilled, installed and currently operating, on the Newnes Plateau.

Water pumped out of the underground workings at Bore 8 will be transferred via predominantly trenched pipelines to Wallerawang Power Station, as part of the existing SDWTS.

Based on the assessment of environmental and socio–economic considerations in **Section 7.0**, which has been multi–disciplinary and involved consultation with relevant stakeholders, the Project is anticipated to pose negligible environmental impacts, and as such poses negligible impacts beyond those already approved under development consent S91/06569/001.

11.0 REFERENCES

Aurecon (2010) Review of Sump Design and Construction Process

Aurecon (2012) Bore 8 – Assessment of Potential Hydrogeological Impacts, Springvale Colliery

Centennial Coal (2009) Mining Operations Plan for Springvale Colliery

Centennial Coal (2012) Springvale Colliery Annual Environmental Management Report

Centennial Coal (2010) Centennial Coal Greenhouse Gas Assessment Guidance Notes

Department of Climate Change and Energy Efficiency (2011) National Greenhouse Accounts Factors

Department of Environment and Climate Change (DECC) (2008) Managing Urban Stormwater: Soils and Construction - Volume 2A Installation of Services (the Blue Book Volume 2A).

DECC (2008) Managing Urban Stormwater: Soils and Construction - Volume 2C Unsealed Roads (the Blue Book Volume 2C).

DECC (2009) Interim Construction Noise Guideline

Department of Environment and Climate Change and Water (DECCW) (2011) NSW Road Noise Policy

DECCW (2010) Aboriginal Cultural Heritage Consultation Requirements for Proponents

DECCW (2005) Approved Methods for the Modelling and Assessment of Air Pollutants in NSW

Department of Planning and Infrastructure (2012) Guidelines for Agricultural Impact Statements

Department of Energy, Utilities and Sustainability (2005) Guidelines for Energy Savings Action Plans

DSEWPC (2012) The National Pollutant Inventory Emission Estimation Technique Manual for Mining v3.1

GSSE (2012) Surface Water Assessment, Dewatering Bore 8, Springvale Colliery

Heritage Computing (2012) Springvale Mine Modelling Review and Groundwater Mine Inflow Assessment for the Bore 8 Modification

King, D. P. (1993) Soil Landscapes of the Wallerawang 1:100 000 Sheet, Department of Conservation and Land Management, Sydney

Landcom (2004) Managing Urban Stormwater: Soils and Construction – Volume 1, 4th Edition, (the Blue Book Volume 1)

Lithgow City Council (2007) Lithgow City Council Strategic Plan

NSW EPA (2000) NSW Industrial Noise Policy

NSW Rural Fire Service (2006) Planning for Bushfire Protection

RPS (2012a) Flora and Fauna Assessment, Proposed Surface Mine Dewatering Facility, Bore 8, Springvale Mine

RPS (2012b) Aboriginal Cultural Heritage Assessment, Springvale Mine Dewatering Bore 8

Sinclair Knight (1992) Springvale Coal Project Environmental Impact Statement

Springvale Coal (2012) Annual Environmental Management Report 2011

SLR Consulting (2012a) Noise and Vibration Impact Assessment, Springvale Colliery, Bore 8 Dewatering Facility

SLR Consulting (2012b) Air Quality Impact Assessment and Greenhouse Gas Assessment, Springvale Colliery, Bore 8 Dewatering Facility

12.0 ABBREVIATIONS

ACHCR	Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010
AEMR	Annual Environmental Management Report
AFC	Armoured Face Conveyor
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AIS	Agricultural Impact Statement
APZ	Asset Protection Zone
ASL	Above sea level
BoM	Bureau of Meteorology
BPL	Bushfire Prone Land
CCC	Community Consultative Committee
CCL	Consolidated Coal Lease
CL	Consolidated Lease
CT	Cut Through
CPP	Coal Preparation Plant
DECCW	Former NSW Department of Climate Change and Water
DGRs	Director–General's Requirements
DP&I	NSW Department of Planning and Infrastructure
DTIRIS	NSW Department of Trade and Investment, Regional Infrastructure and Services
SDWTS	Springvale–Delta Water Transfer Scheme
EA	Environmental Assessment
EEC	Endangered Ecological Communities
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPA	Environmental Protection Authority
EPI	Environmental Planning Instrument
EPL	Environmental Protection Licence
ESD	Ecologically Sustainable Development
GHG	Greenhouse Gas
GSSE	GSS Environmental
ha	Hectares
LDP	Licensed Discharge Point
LEP	Local Environment Plan
LGA	Local Government Area
LW	Longwall
ML	Mining Lease

MPL	Mining Purposes Lease
MOP	Mining Operations Plan
Mtpa	Million tonnes per annum
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NOW	NSW Office of Water
NP&W Act	*National Parks and Wildlife Act 1974*
OEH	NSW Office of Environment and Heritage
PLL	Private Lands Lease
POEO Act	*Protection of the Environment Operations Act 1999*
RBL	Rating Background Level
REA	Reject Emplacement Area
RL	Relative Level
ROM	Run of Mine
SEPP	State Environmental Planning Policy
SEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Community
SLR	SLR Consulting Australia
THPSS	Temperate Highland Peat Swamps on Sandstone
tph	tonnes per hour
TSC Act	*Threatened Species Conservation Act 1995*
TSS	Total Suspended Solids

Centennial Coal

Centennial Coal Company Limited
P O Box 1000
Toronto NSW 2283
www.centennialcoal.com.au

Centennial Coal
Environment Matters