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<td>Carly McCormack</td>
<td>Gary Mulhearn</td>
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<td>Gary Mulhearn</td>
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<td></td>
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<td>Howard Reed</td>
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<tr>
<td></td>
<td>Environment Protection Authority</td>
<td>Mark Hartwell</td>
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1 INTRODUCTION

Austar Coal Mine Pty Ltd (Austar), a subsidiary of Yancoal Australia Limited (Yancoal), operates the Austar Coal Mine, an underground coal mine located approximately 10 kilometres southwest of Cessnock in the lower Hunter Valley in NSW (refer to Figure 1). The Austar Coal Mine incorporates the former Pelton, Ellalong, Cessnock No. 1 (Kalingo) and Bellbird South Collieries and includes coal extraction, handling, processing and rail and road transportation facilities (refer to Figure 1).

Extensive mining has been undertaken within the Austar Coal Mine since 1916. Historical mining was predominantly via bord and pillar mining and more recently via conventional longwall mining and longwall top coal caving (LTCC) methods. Mining within the Bellbird South areas (Southland, Stage 1 and Stage 2, refer to Figure 1) was approved by the Minister for Urban Affairs and Planning in 1996 under DA 29/95, while mining of Stage 3 was approved by the Minister for Planning in 2009 under Project Approval 08_0111. Longwall mining commenced in the Ellalong Colliery area in 1983 and has subsequently progressed into the Bellbird South and the Stage 3 areas.

Mining is currently proceeding in the LW81-B7 mining area in accordance with DA 29/95 (as modified).

1.1 Purpose

This Air Quality and Greenhouse Gas Management Plan (AQGHGMP) outlines the management measures to be implemented as a part of the continued operations at the Austar Mining Complex to minimise the potential for air quality and greenhouse gas impacts on the local community and the environment.

The purpose of this AQGHGMP is to:

- Describe the air quality and greenhouse gas monitoring program associated with the Austar Mining Complex;
- Provide a mechanism for review of performance against relevant air quality impact assessment criteria;
- Provide a description of the measures to be implemented by Austar to mitigate air quality and greenhouse gas impacts; and
- Describe the review, reporting and continual improvement process.

The AQGHGMP has been prepared in accordance with the relevant conditions of the Project Approval 08_0111, Development Consent DA29/95 and Environment Protection Licence 416 (refer to Appendix A for details of conditions).

1.2 Management Plan Structure

This AQGHGMP has been structured as follows:

- **Section 2 Air Quality Management**: Details baseline data, impact assessment criteria, the monitoring program, management controls, and the continual improvement program;
- **Section 3 Greenhouse Gas Management**: Details baseline data, impact assessment criteria, and measurement and evaluation criteria;
• **Section 4 Reporting**: Documents internal, external and incident reporting protocols and community complaint handling;

• **Section 5 Contingency Response and Adaptive Management**: Details the process should air quality impacts exceed performance criteria;

• **Section 6 Review and Improvement**: Documents when review of this AQGHGMP is to occur;

• **Section 7 Roles and Accountabilities**: Specifies roles and accountabilities for employees and contractors; and

• **Section 8 References**.

### 1.3 Stakeholder Consultation

The EPA was consulted during the preparation of this AQGHGMP. During a site meeting in March 2013, an informal discussion on the proposed extension to the air quality monitoring network was conducted. An updated version of this plan was provided to the EPA in January 2015.

The AQGHGMP was revised and updated following the DA29/95 MOD 6 approval, and again provided to EPA for comment in April 2017. The EPA response on the April 2017 revision is included as Appendix B.

This revision of the AQGHGMP (June 2018) addresses any previous comments provided by the EPA, however further consultation has not been sought based on the LWB4-B7 Modification (MOD7) not involving any additional surface development, and due to the predicted minimal impacts on the ground surface associated with subsidence being unlikely to have any adverse impacts on current land uses.

OEH was consulted regarding Energy Savings Actions Plans in March 2013, specifically in relation to the Energy Savings Action Plan (ESAP) and Energy Efficiency Opportunities programs. No changes to these items are proposed in the 2018 update. Further detail regarding the Energy program is provided in Section 3.3.
2 AIR QUALITY MANAGEMENT

2.1 Baseline Data

The Austar Mine Complex comprises several surface facilities with potential for dust generation:

- Pelton CHPP operations;
- Austar Pit Top;
- Kalingo Infrastructure Area (3 shaft upcast ventilation fans); and
- Kitchener Surface Infrastructure Site (5 shaft upcast ventilation fans).

Air quality monitoring has been undertaken by Austar since 2007 and has comprised depositional dust gauges and particulate matter \(<10\mu m \text{ (PM}_{10}\) high volume air samplers (HVAs). The location of the existing depositional dust gauges and PM\(_{10}\) HVAS’s where baseline data is available is shown on Figure 2.

A summary of annual average results for depositional dust gauges and PM\(_{10}\) HVAS’s is provided in Table 2.1 and Table 2.2, respectively.

### Table 2.1 Depositional Dust Gauges – Annual Average Insoluble Solids (g/m\(^2\).month)

<table>
<thead>
<tr>
<th>Year</th>
<th>D1 (Insoluble solids g/m(^2))</th>
<th>D2 (Insoluble solids g/m(^2))</th>
<th>D3 (Insoluble solids g/m(^2))</th>
<th>D4 (Insoluble solids g/m(^2))</th>
<th>D5 (Insoluble solids g/m(^2))</th>
<th>D7 (Insoluble solids g/m(^2))</th>
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<td>1.0</td>
<td>1.0</td>
<td>0.8</td>
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<td>-</td>
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<tr>
<td>2008</td>
<td>0.7</td>
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<td>-</td>
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<td>0.9</td>
<td>1.7</td>
<td>0.9</td>
<td>1.0</td>
<td>1.0</td>
<td>1.1</td>
</tr>
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</table>

Notes:
*2007 Annual Average calculated on data collected from April to December 2007.

~Annual average data for 2013 calculated from July to December 2014.

# Investigation found annual average result influenced by resident’s activities (earthworks, vegetation clearing, burning off).

Annual average depositional dust results are below the long term impact assessment criteria for maximum total deposited dust levels of 4g/m\(^2\)/month on all occasions.

With the exception of D2 (Pelton Village) in 2012 and 2013, annual average depositional dust results have not exceeded the maximum increase in deposited dust levels of 2g/m\(^2\)/month. An investigation into elevated depositional dust measurements at D2 was undertaken and found that Austar was not reasonably the source of the increased results, with local ground disturbance activities by the neighbouring resident (earthworks, clearing, mowing, pile burning) potentially the contributing factor...
in months where elevated results were observed. Elevated results will continue to be investigated where identified (refer Section 4).

**TABLE 2.2 HVAS – Annual Average Particulate Matter <10µm (PM$_{10}$ µg/m$^3$)**

<table>
<thead>
<tr>
<th>Year</th>
<th>HVAS1 (PM$_{10}$ µg/m$^3$)</th>
<th>HVAS2 (PM$_{10}$ µg/m$^3$)</th>
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<td>17.9</td>
<td>18.0</td>
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<td>14.0</td>
<td>14.3</td>
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<td>2009</td>
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<td>2017</td>
<td>11.4</td>
<td>14.6</td>
<td>10.5</td>
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Notes:  
*2007 Annual Average calculated on data collected from 24 March 2007 to end December 2007.  
*2014 HVAS3 Annual Average calculated on data collected from 9 June 2014 to end December 2014.

Annual average results for PM$_{10}$ are well below the long term impact assessment criterion of 30µg/m$^3$.

### 2.1.1 Complaints History

A review of the Austar community complaints register for the last seven years found there have been three community complaints regarding dust during the period.

### 2.1.2 Air Quality Impact Assessment – Stage 3 Extension

The Ventilation Shaft Air Quality Impact Assessment (Umwelt, 2008) prepared to inform the Stage 3 Environmental Assessment assessed the potential impacts of the discharge air from the operation of the upcast ventilation shaft on the surrounding environment. The assessment indicates very small incremental increases in particulate matter concentration and dust deposition at all nearest potentially affected residences due to operation of the upcast ventilation fans. The predictions indicate that dust deposition rates, PM$_{10}$ and total suspended particulates (TSP) concentrations will be well within the relevant OEH air quality criteria at all surrounding residences.

Gas monitoring of the existing Austar ventilation shaft has indicated that the concentration of coal related gases such as methane and sulphur compounds is negligible and will not have an impact on the surrounding environment.
2.2 Air Quality Impact Assessment Criteria

Results from air quality monitoring will be compared to the relevant impact assessment criteria provided in the sections below.

2.2.1 Dust Concentration

Austar shall ensure that the dust emissions generated by activities at the:

- Kitchener Surface Infrastructure Site; and
- Kalingo Infrastructure Upgrade Area,

do not cause additional exceedances of the air quality impact assessment criteria listed in Table 2.3 at any residence on privately-owned land, or on more than 25 percent of any privately owned land.

<table>
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<th>Pollutant</th>
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<th>Criteria</th>
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<td>Total suspended particulate (TSP) matter</td>
<td>Annual</td>
<td>90µg/m³</td>
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<td>Particulate matter &lt;10µm (PM₁₀)</td>
<td>Annual</td>
<td>30µg/m³</td>
</tr>
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<td>Particulate matter &lt;10µm (PM₁₀)</td>
<td>24 hour</td>
<td>50µg/m³</td>
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2.2.2 Dust Deposition

In addition to health impacts, airborne dust also has the potential to cause nuisance impacts by depositing on surfaces and vegetation. Dust deposition levels refer to the quantity of dust particles which settle out of the air as measured in grams per square metre per month (g/m²/month) at a particular location.

OEH express dust deposition criteria (refer to Table 2.4) in terms of an acceptable increase in dust deposition above the existing background dust deposition levels. For example, in residential areas with annual average dust deposition levels of between 0 and 2 g/m²/month an increase of up to 2 g/m²/month would be permitted before it would be considered that a significant degradation of air quality had occurred.

Austar shall ensure that the dust emissions generated by the:

- Kitchener Surface Infrastructure Site, and
- Kalingo Infrastructure Upgrade Area,

do not cause additional exceedances of the air quality impact assessment criteria listed in Table 2.4 at any residence on privately-owned land, or on more than 25 percent of any privately owned land.

<table>
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<tr>
<th>Pollutant</th>
<th>Averaging Period</th>
<th>Maximum increase in deposited dust level</th>
<th>Maximum total deposited dust level</th>
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</thead>
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<tr>
<td>Deposited dust</td>
<td>Annual</td>
<td>2 g/m²/month</td>
<td>4 g/m²/month</td>
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</table>

2.3  Air Quality Monitoring Program

To assess compliance against dust deposition and dust concentration criteria for Austar, TSP, PM$_{10}$ and depositional dust will be routinely monitored at locations shown on Figure 2. A meteorological station is operated at the CHPP.

In addition, one continuous dust monitor (TEOM) is included in the Austar Mining Complex monitoring network to meet PA08_0111 requirements relating to continuous monitoring. Of the Austar Mining Complex infrastructure areas, the CHPP has the largest disturbance area and therefore the greatest potential to generate dust. Based on wind data monitored from Austar’s weather station, the prevailing wind direction at the CHPP during October-March is ENE and April-September SW. Given there are very few receptors to the SW of the CHPP and that the township of Bellbird is located to the NE, Bellbird was chosen as the continuous dust monitor location. This complements the PM$_{10}$ HVAS’s which are located to the south and west of the CHPP.

The network to monitor air quality impacts and type of monitoring at each location is shown in Table 2.5.

**Table 2.5  AIR QUALITY MONITORING NETWORK**

<table>
<thead>
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<th>ID</th>
<th>Location</th>
<th>Monitoring Equipment</th>
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<tr>
<td>D1</td>
<td>Pyne Way, Mount View</td>
<td>DDG, HVAS</td>
</tr>
<tr>
<td>D2</td>
<td>Ellalong Road, Pelton Village</td>
<td>DDG, HVAS</td>
</tr>
<tr>
<td>D3</td>
<td>Bimbadeen Road, Mount View</td>
<td>DDG</td>
</tr>
<tr>
<td>D4</td>
<td>Ellalong Village</td>
<td>DDG</td>
</tr>
<tr>
<td>D5</td>
<td>South of No 3 shaft upcast ventilation shaft</td>
<td>DDG</td>
</tr>
<tr>
<td>D6</td>
<td>Bimbadeen Road, Mount View</td>
<td>TEOM</td>
</tr>
<tr>
<td>D7</td>
<td>Pelton Fire Trail, Quorrobolong</td>
<td>DDG</td>
</tr>
<tr>
<td>D8</td>
<td>Coney Creek Lane, Quorrobolong</td>
<td>DDG, HVAS</td>
</tr>
<tr>
<td>D9</td>
<td>Kitchener Village</td>
<td>DDG</td>
</tr>
<tr>
<td></td>
<td>Met Station</td>
<td>Meteorological Station</td>
</tr>
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</table>

The frequency of air quality monitoring to be undertaken for each type of monitoring equipment is detailed in Table 2.6.

**Table 2.6  AIR QUALITY MONITORING NETWORK AND FREQUENCY**

<table>
<thead>
<tr>
<th>Type of Monitoring</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{10}$ HVAS</td>
<td>Every 6 days</td>
</tr>
<tr>
<td>Depositional Dust Gauges</td>
<td>Monthly</td>
</tr>
<tr>
<td>TEOM</td>
<td>Continuous</td>
</tr>
<tr>
<td>Meteorological Station</td>
<td>Continuous</td>
</tr>
</tbody>
</table>

Air quality monitoring locations will be reviewed and, where necessary, modified in consultation with DPE and EPA over the life of operations according to progressive monitoring results and physical changes in mining operations.
Where possible, air monitoring equipment will be sited in accordance with Australian Standard AS/NZS 3580.1.1:2007: Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment.

### 2.3.1 High Volume Air Sampler Methodology

HVAS are operated in accordance with OEH’s ‘Approved methods for the sampling and analysis of air pollutants in NSW’ (EPA, 2006) and Australian Standard AS/NZS3580.9.6:2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM$_{10}$ high volume sampler with size-selective inlet – Gravimetric method.

Total suspended particulates (TSP) is not directly measured by instrumental techniques but is calculated on the basis that long term PM$_{10}$ concentrations are approximately 40% of the corresponding long term TSP concentration (Holmes, 2003). Holmes (2003) stated in the Air Quality Impact Assessment report for the Wambo Development Project that “Monitoring data from areas in the Hunter Valley where co-located TSP and PM$_{10}$ monitors have been operated for reasonably long periods of time indicate that long term PM$_{10}$ concentrations are approximately 40% of the corresponding long term TSP concentration.” Total suspended particulates will be determined by calculation based on this accepted long term PM$_{10}$ to TSP ratio. The formula for this calculation is:

\[
\text{Calculated TSP Concentration (µg/m}^3\text{)} = \text{Measured PM}_{10}\ 	ext{Concentration (µg/m}^3\text{)} \times 2.5
\]

### 2.3.2 Dust Deposition Gauge Methodology

Monitoring of dust deposition gauges is undertaken in accordance with OEH’s ‘Approved methods for the sampling and analysis of air pollutants in NSW’ (EPA, 2006). Deposited dust is assessed as insoluble solids as defined by AS/NZS 3580.10.1:2003 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method.

Samples are collected every 30 +/- 2 days. Samples are additionally analysed for ash residue and combustible matter to the Australian Standard to assist in determining possible contamination and dust sources.
2.3.3 Continuous Dust Monitoring (TEOM)

The TEOM data is used to compliment HVAS data in the following manner:

- Provide data to the northeast of the CHPP where no HVAS currently exists;
- Provide an understanding of regional episodic dust events;
- Provide an understanding of local episodic dust events;
- Provide an understanding of potential dust episodes resulting from mining activities; and
- Alert when dust levels are approaching the relevant criteria so that the operation can be adjusted accordingly (if required).

The TEOM unit operates in accordance with OEH’s ‘Approved methods for the sampling and analysis of air pollutants in NSW’ (EPA, 2006) and AS 3580.9.8:2008 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM10 continuous direct mass method using a tapered element oscillating microbalance analyser.

2.3.4 Meteorological Monitoring

Austar utilises a continuous weather recording station located at the CHPP site to record meteorological data (refer Figure 2). The location of the weather station facilitates the capture of data that is representative of the area subject to potential dust emissions. Logged meteorological parameters include:

- Wind speed;
- Wind direction;
- Sigma-theta from sampled wind direction measurements;
- Temperature; and
- Rainfall.

The weather station is maintained and operated in accordance with OEH’s ‘Approved methods for the sampling and analysis of air pollutants in NSW’ (EPA, 2006) and AS 3580.14:2011 Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications.

2.4 Air Quality Management Controls and Continual Improvement

In order to mitigate potential air quality impacts from the Austar Mining Complex, a number of air quality management controls will be implemented throughout the life of the operation. These controls are detailed in the sections below and align to the findings of the report on Particulate Matter Best Management Practice Pollution Reduction Program (Todoroski Air Sciences, September 2012).

2.4.1 Design Controls

In addition to the air quality controls which will be implemented by Austar during construction and mining operations, a number of air quality controls have also been incorporated into the design of the Austar Mining Complex:

- Use of covered conveyors, enclosed transfer points and underground reclaimers for all ROM and product coal transfers. Only washery reject is transported by truck;
• The haul road to the reject emplacement area is essentially level, narrow and is vegetated right to the edge. In part, trees line the road and arc over it. This reduces the wind speed acting on the surface of the road which reduces the evaporation rate following watering for dust suppression;
• ROM and product coal stockpiles are located in densely forested area. The site is surrounded by trees which act as a vegetative wind break;
• Enclosed coal handling and preparation plant; and
• Progressive site rehabilitation and revegetation.

2.4.2 Operational Controls

In addition to the design controls listed above, operational controls implemented by Austar are detailed in the sections below. The implementation of these controls will be undertaken by Austar or the relevant contractor appointed with responsibilities for a specific area.

2.4.2.1 Unsealed Roads

Austar implement the following controls to reduce dust emissions from unsealed roads:

• Optimise load capacity when hauling reject to limit number of return trips and travel distance of haul trucks;
• Speed limit on haul road 50km/hour and 30km/hour at CHPP site;
• Haul roads and other unsealed roads are watered when in use;
• Visual dust monitoring is undertaken by supervisory staff to ensure effective dust control; and
• Regular maintenance of haul roads including grading, and where appropriate gravelling, of heavy trafficked areas. Grader speed is maintained below 8km/hour.

2.4.2.2 Sealed Roads

Austar will provide for the rapid clean-up of material spilled onto any sealed road, with re-routing of traffic around the spills until they have been removed, to minimise the potential for dust emissions from sealed roads. Road sweepers are employed where necessary.

2.4.2.3 Conveyors and Coal Stockpiles

Austar implement the following controls to reduce dust emissions from conveyors and coal stockpiles:

• ROM coal reaches the surface in an oversaturated state being transported by covered conveyor to the ROM stockpile;
• Water in the ROM coal is highly saline and when the ROM coal dries the stockpile surface forms a hard crust;
• Minimising the drop height when loading a truck or stockpile; and
• Visual monitoring of coal stockpiles in adverse weather conditions for dust emissions.

2.4.2.4 Rehabilitation Areas

Austar implement the following controls to reduce dust emissions from rehabilitation area projects:

• Reject emplacement area is regularly compacted to stabilise the surface;
• Completed areas are progressively vegetated to reduce area of exposed soils at any one time;
• Minimise double handling of materials;
• Avoid dozer operations at wind exposed areas during dry, windy conditions; and
• Visual monitoring of rehabilitation projects by supervisors, with operations modified or ceased when elevated dust levels are observed to occur.

2.4.2.5 Spontaneous Combustion
Spontaneous combustion has the potential to result in air quality and odour impacts. Underground ventilation is carefully managed and monitored to reduce the potential for spontaneous combustion. A real time gas monitoring system underground allows identification of concerns and a rapid response plan is in place to address any heating or ventilation concerns should they arise. A 2000m³/hour nitrogen inertisation plant is maintained on-site and used to pro-actively manage spontaneous combustion.

Coal stockpiles are also monitored and regularly inspected. Immediate action is taken if heating is detected in the surface stock piles. Should the early stages of spontaneous combustion be detected, close monitoring will be undertaken to minimise the risk of the outbreak. The stockpile will be spread and cooled at predetermined trigger points under the supervision of the CHPP Manager.

2.4.2.6 Odour and Fume Emissions
In accordance with Condition 5 Schedule 4 of Project Approval 08_0111 Austar are required to manage offensive odours.

Odours identified during instances of spontaneous combustion will be managed in accordance with Section 2.4.2.5 above. Corrective actions for offensive odours will be developed as necessary.

Gas monitoring of the existing Austar ventilation shaft indicated that the concentration coal related gases such as methane and sulphur compounds is negligible and will not have an impact on the surrounding environment. Odours associated with the mine complex’s ventilation system having the potential to impact off-site will be assessed and corrective actions developed as necessary.

2.4.3 Continuous Improvement Program
Austar has undertaken a Particulate Matter Best Management Practice Pollution Reduction Program Report (Todoroski Air Sciences) in September 2012. The controls above are largely aligned with the findings of the report. It is noted that the complaints history in relation to dust show there have been minimal community complaints regarding dust which may have been generated from the Austar Mine Complex for the past seven years.

Where possible, Austar will implement reasonable and feasible best practice air quality mitigation measures. The basis for continuous improvement of air quality mitigation measures will be through the ongoing monitoring of dust impacts and the contingency response and adaptive management process outlined in Section 5 of this plan. Austar will investigate ways to reduce the air quality impacts generated by the operation through the development of corrective/preventative actions resulting from the contingency response and adaptive management process. Any new mitigation measures that are implemented as a result of these investigations will be reported in the Annual Review Report.
3 GREENHOUSE GAS MANAGEMENT

3.1 Objectives
The objectives of the AQGHGMP for Greenhouse Gas emissions are to ensure that appropriate procedures and programs of work are in place at the Austar Mine Complex to:

- Document the greenhouse gas and energy programs Austar is committed to;
- Establish a monitoring system to capture greenhouse gas and energy use; and
- Provide a mechanism for reporting monitoring results against greenhouse gas and energy use reporting criteria.

3.2 Baseline Data
Greenhouse gas emissions associated with the Austar Mining Complex have been categorised into Scope 1, 2 and 3 emissions as per the Austar Coal Mine Project – Stage 3 Greenhouse Gas and Energy Assessment (Umwelt, September 2008). The two “scope” categories that are directly related to the on-site operation of Austar can be defined as:

- Scope 1 – covers direct emissions from the combustion of fuels (for example, diesel) and industrial processes within the boundary of the mining operation; and
- Scope 2 – covers indirect emissions from the mining operation’s consumption of purchased electricity that is produced by another organisation.

Annual forecast emissions for the Austar Mining Complex for the approved project are presented in Table 3.1.

**Table 3.1** ANNUAL FORECAST EMISSIONS 2011-2025

<table>
<thead>
<tr>
<th>Scope</th>
<th>Source</th>
<th>Emissions (Annual Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1</td>
<td>Onsite Fuel Combustion</td>
<td>1,392 t CO_{2}-e/kJ</td>
</tr>
<tr>
<td></td>
<td>Fugitive Emissions from Underground Mining</td>
<td>28,800 t CO_{2}-e/3.6Mtpa ROM</td>
</tr>
<tr>
<td>Scope 2</td>
<td>Stationary Source Emissions (Electricity Consumption)</td>
<td>65.337 t CO_{2}-e/kWh</td>
</tr>
</tbody>
</table>

A mine gas monitoring station is located on the surface near the No.3 Shaft facility. Monitoring data indicates low levels of seam gas emissions and a composition that is predominantly CO\textsubscript{2} (2015-2016 Average 0.1%) with some CH\textsubscript{4} (2015-2016 Average 0.1%) under normal operating conditions. Gas desorption tests have been carried out previously in several boreholes and at development faces in the mining area. This indicated seam gas levels in the area are low, however have risen slightly in the Stage 3 area.
3.3 Greenhouse Gas Impact Assessment Criteria

3.3.1.1 Compliance Reporting Criteria

National Greenhouse and Energy Reporting Systems

Austar are required to report greenhouse gas emissions in accordance with the National Greenhouse and Energy Reporting System (NGERS) as its parent company (Yancoal Australia Pty Limited) triggers corporate reporting thresholds and the site triggers individual facility thresholds. The National Greenhouse and Energy Reporting Act 2007 requires individual sites to report greenhouse gas emissions, energy consumption and energy production if one of the following threshold criteria is met:

- The site generates greenhouse gases (Scope 1 and 2) in excess of 25,000 t CO₂-e or more; or
- The site produces in excess of 100 TJ of energy; or
- The site consumes in excess of 100 TJ of energy.

Energy Savings Action Plan (ESAP)

Austar are required to include an ESAP as per Schedule 4 Condition 6 of Project Approval 08_0111 as part of the AQGHGMP. In addition, Austar’s Statement of Commitments in PA08_0111 committed to an internal energy and greenhouse gas management plan. Austar was a participant in the federal government Energy Efficiency Opportunity (EEO) program until its repeal in September 2014. In 2013, Austar consulted with OEH in relation to the Project Approval condition which requires preparation of an ESAP in consultation with OEH. OEH indicated that the ESAP program was being discontinued at state level. OEH indicated that ESAP mirrors the intent of the EEO program, and as Austar was already committed to the EEO program for identifying and assessing energy efficiency opportunities in a structured manner, OEH agreed an ESAP administered by OEH is not required (OEH correspondence, 13 March 2013).

With both state (ESAP) and federal (EEO) formal energy programs now discontinued, the cost of energy and the efficiency of its use revert to being an internal business imperative. Energy efficiency is not only an important cost-reduction measure, but an important strategic tool to unlock business productivity and drive competitive advantage. In 2018, OEH offers businesses assistance (technical support, subsidised technical investigations, financial business cases to support energy efficiency projects), through an “Energy Saver” program, however these have historically not been available to those subscribed to the EEO program.

Austar’s internal Energy Program includes reviewing:

- energy efficiency in plant and equipment procurement, consideration will be given to the life cycle costs advantages obtained by using energy efficient components;
- the opportunity to install additional sub-metering for offices, workshops and winders;
- operational initiatives such as turning off idling plant equipment;
- control and temperature settings for air conditioning units in offices and switchrooms;
- automatic control of external and internal lighting;
- potential energy efficiency opportunities in water pumping and dust suppression systems;
- review changes in power consumption with installation of new equipment and install power factor correction equipment to suit; and
- review workshop and bathhouse lighting and office and high bay lighting.

Austar’s original EEO assessment conducted in 2014 included a review of the above items as a baseline to progress energy efficiency opportunities. Austar will analyse and implement energy efficiency initiatives as an internal business imperative, generally in accordance with framework of the cyclical EEO program, and may utilise the OEH “Energy Saver” program to assist (if available), in order to meet the Project Approval condition relating to Energy Savings Action Plan.

The following diagram outlines the general steps required to undertake an effective Energy Program, and shows that preparing an Energy Efficiency Opportunity Assessment (EEOA) fulfils those requirements.
### Indicative Links to Other Energy Programs

<table>
<thead>
<tr>
<th>Energy Savings Action Plans</th>
<th>Other Energy Programs (which may partially or wholly fulfil requirements)</th>
</tr>
</thead>
</table>
| 1. Determine baseline energy used | ✓ EEOA  
✓ recently completed energy audits  
✓ EPC – detailed feasibility study  
✓ DMPP audit  
✓ CCP® – Milestone 1 and 2 |
| 2. Planning at management level | ✓ EEOA  
✓ ESB – management diagnostic  
✓ CCP® – Milestone 3  
✓ CCP® Plus – organisational review |
| 3. Determine opportunities to reduce energy consumption | ✓ EEOA  
✓ recently completed energy audits  
✓ EPC – detailed feasibility study  
✓ DMPP audit |
| 4. Putting together Savings Action Plans for implementation | ✓ EEOA  
✓ ESB  
✓ EPC  
✓ CCP® – Milestone 3 |
| Implementing and reviewing Savings Action Plans | ✓ EEOA  
✓ CCP®  
– Milestone 4 and 5  
– Plus: Planning and Review  
– Advancing Action Areas |

**Notes:**  
- EPC – Energy Performance Contract  
- ESB – Energy Smart Business program  
- DMPP – Demand Management and Planning Project, joint initiative of Transgrid and Energy Australia, managed by DEUS  
- CCP® – Cities for Climate Protection – ICLEI – A/ANZ – Local Governments for Sustainability Campaigns (International Council for Local Environmental Initiatives)

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3.3.1.2 **Greenhouse Gas Performance Measures**
Austar is not required to commit to specific greenhouse gas performance targets under legislation or industry codes, but is required to report to the federal government in a manner which may be reported publicly.

Austar will, however, continue to refine energy efficiency reductions based on the outcomes of monitoring and following continuous improvement processes resulting from the Energy Savings Action Plan.

Greenhouse gas indicators will be included in the Annual Review of environmental performance prepared for the DPE.

3.3.2 **Greenhouse Gas Management Controls**
The primary sources of greenhouse gas at the Austar Mining Complex are:

- Electricity consumption;
- Fuel combustion; and
- Fugitive emissions.

Greenhouse gas emissions can be managed through project design, procurement processes and project operation. The management controls implemented at Austar Mining Complex will be initiated at both corporate and site levels. The following sections include a combination of corporate and site based greenhouse gas management controls.

3.3.2.1 **Design Controls**
The Stage 3 expansion of the Austar Mining Complex was selected based on operational efficiency and development cost. Longwall Top Coal Caving (LTCC) technology was chosen for mining of coal, which allows for significantly increased resource extraction and increased operational energy efficiency within thick coal seams. Greenhouse gas and energy efficiency assessments were included in the design decision making process.

3.3.2.2 **Operational Controls**
Operational greenhouse gas management controls will be evaluated and implemented at both corporate and site levels.

**Fugitive Emissions**
As described in Section 3.2, Austar’s monitoring data indicates low levels of seam gas emissions and a composition that is predominantly CO₂ (2015-2016 Average 0.1%) with some CH₄ (2015-2016 Average 0.1%) under normal operating conditions.

A feasibility study relating to the beneficial capture and reuse of methane is required by PA08_0111 relating to fugitive emissions. Common fugitive methane emission management controls such as flaring, methane capture and energy production have been considered for the Austar Mining Complex, however internal evaluation has deemed the technologies are technically unfeasible due to the low methane concentration generated from the coal seam.
The low methane concentrations mean that Austar Mining Complex underground workings do not require pre-drainage to manage methane levels, with the main ventilation system capable of meeting safe ventilation requirements of the underground mine. Without a pre-drainage system supplying high concentrations of methane it is not technically feasible to flare methane and/or capture methane for beneficial reuse (i.e. energy production).

There are technologies available to potentially beneficially reuse ventilation air methane (VAM), such as a thermal flow reversal reactor (TFRR) which oxidises low methane concentrations in the air flow exhausted from the underground ventilation system to produce heat, however, these systems require ventilated methane concentrations of 0.2% to 1.2% to operate. Austar’s methane concentration in the ventilation stream is approximately 0.1% by volume, meaning these technologies are not feasible.

Management controls to address fugitive emissions will continue to be evaluated by Yancoal and Austar as part of the NGERS program.

**Energy Use**
Managing energy use is the primary greenhouse gas management control option at the Austar Mining Complex. Austar will develop options to manage energy use through development and maintenance of the internal ESAP.

**Waste**
Waste management at Austar is undertaken using licensed waste contractors to collect and dispose of waste from the Austar site on a regular basis under total waste management contracts. Austar will continue to work with external waste contractors and mine site personnel to implement a total waste management system.

The ongoing waste disposal program includes the progressive removal of scrap metals, woods, waste oils and cardboard for recycling, the sale of disused equipment that is of value, and the removal of non-recyclable material to approved waste disposal facilities. Recycling diverts material from landfill and reduces potential methane emissions.

Austar also operates two aerated waste water treatment systems, which are the most cost effective way of managing greenhouse gas emissions from waste water.

**Industrial**
A very small portion of greenhouse gas emissions are generated by gas (SF₆) insulated switch gear installed at the Austar Mining Complex. Installing SF₆ free switch gear will be considered in line with Austar’s procurement process as new switch gear is installed and/or replaced.

### 3.3.2.3 Prioritising GHG Management Controls
Through the implementation of the internal ESAP Austar will identify, plan, monitor, review and evaluate selected energy efficiency opportunities, each of which will also have a greenhouse gas management benefit by reducing Scope 1 emissions. To prioritise the implementation of greenhouse gas management controls, Austar will...
gas management controls, Austar will use technical review and cost benefit analysis to evaluate and prioritise any selected operational controls.

3.3.2.4 Continuous Improvement
Austar will identify initiatives for continuous improvement through review of performance of greenhouse gas reduction initiatives and through the internal ESAP.

3.4 Measurement and Evaluation

3.4.1 Greenhouse Gas Monitoring Program
Austar will monitor greenhouse gas emission, energy use and energy production by direct monitoring and modelling from activity data. The greenhouse gas monitoring program will involve direct measurement of fugitive emissions and the collation of activity data such as energy use, coal production and waste disposal. Monitoring will be undertaken to meet the standards required by the NGERS Act.
4 REPORTING

All internal and external reporting requirements will be managed by Austar, in accordance with the Austar Environmental Management Strategy (EMS). Specific reporting functions relevant to this AQGHGMP are detailed below.

4.1.1 Internal Review

The Austar Environment and Community Manager will review air quality results monthly and report to senior management the results of investigations of any complaints and any exceedances of the air quality impact assessment criteria.

4.1.2 External Reporting - Performance

In accordance with Schedule 7 Condition 9 of Project Approval 08_0111 and Schedule 5 Condition 12 of DA29/95, a copy of this Plan and summaries of air quality monitoring results compared against the air quality criteria specified in the Project Approval will be made publicly available on the Austar website www.austarcoalmine.com.au.

Additionally, the Annual Review Report will include all air quality monitoring results for the corresponding year. The Annual Review report will also include an assessment of the air quality monitoring results against the air quality impact assessment criteria, the predictions in the EA and any trends in monitored dust levels over the period in accordance Schedule 7 Condition 3 of Project Approval 08_0111. In addition, any complaints relating to dust emissions from Austar, and the response actions taken, will be reported in the Annual Review report.

A summary of air quality monitoring results will also be presented to the Austar Community Consultative Committee (CCC) meetings which are held quarterly.

Austar will report its annual greenhouse gas emissions via participation in NGERS and greenhouse gas indicators will be included in the Annual Review of environmental performance prepared for the DPE. Austar will summarise the implementation of the internal ESAP program in the Annual Review prepared for the DPE.

4.1.3 External Reporting - Incident Management

In accordance with Schedule 7 Condition 6 of Project Approval 08_0111 and Schedule 5 Condition 4 of DA29/95 Austar will notify the Director-General and any other relevant agencies, of any incident or non-compliance associated with the air quality or greenhouse gas performance at the mine complex as soon as practicable after Austar becomes aware of the incident or non-compliance.

Within 7 days of the date of the incident or non-compliance, Austar will provide a detailed report on the incident to the Director-General and any other relevant agencies notified. The report will include the following details:

- The date, time and nature of the exceedance/incident;
- Identify the likely cause of the exceedance/incident;
• Description of the response action that has been undertaken to date; and
• Description of the proposed measures to address the exceedance/incident.

Further investigation may be required beyond the 7 days depending on the nature of the incident. For more information on incident reporting, refer to the Austar EMS.

4.1.4 Community Complaints

Community complaints management includes receipt of complaints, investigation, implementation of appropriate remedial action, and feedback to the complainant as well as communication to site management or personnel and notification to external bodies, such as DPE and EPA, where necessary.

In accordance with EPL 416, Austar must keep a record of all complaints made in relation to pollution arising from any activity to which this licence applies. The record must include details of the following:

a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken, the reasons why no action was taken.

The record of a complaint must be kept for at least 4 years after the complaint was made.

Austar operates a telephone complaints line during its operating hours for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant. The Austar Community Complaints Line number is 1800 701 986.

Further information on complaints management can be found in the Austar EMS.
5 CONTINGENCY PLAN FOR UNPREDICTED IMPACTS

The Austar Mine Complex has been operating for many years in its current location. Air quality impacts have been monitored by Austar since 2007 and are well understood.

In the event of previously unpredicted air quality impacts, the following process will be implemented:

- The Environment & Community Manager (ECM) will be notified;
- ECM to determine if the unpredicted impact constitutes an environmental incident that requires external reporting (Section 4);
- Investigate to evaluate the contributing factors to the event. The investigation may include (where applicable):
  - Assessment of weather conditions for the period of monitoring, including wind speed and direction;
  - Visual assessment of the area surrounding the monitoring location to identify any potential sources of dust generation (on site and off site);
  - Review of operational activities during the period of monitoring.
- Implement remedial response and/or adaptive management measures, dependant on the outcomes of the above investigation; and
- Implement the Review and Improvement component of this plan as required.
6 REVIEW AND IMPROVEMENT

The Environment and Community Manager is responsible for review of this AQGHGMP. Review of this plan, and if necessary revision, is to occur within 3 months of:

   a) The submission of an independent environmental audit;
   b) The submission of an environmental incident report;
   c) The submission of an Annual Review; and
   d) Any modification to the conditions of Project Approval 08_0111 or Development Consent DA29/95.

Any changes made to this plan or supporting documents as a result of the review will be made in consultation with EPA and to the satisfaction of the Secretary of DPE.
7 ROLES AND ACCOUNTABILITIES

Specific roles and accountabilities in relation to this Air Quality and Greenhouse Gas Management Plan are outlined below.

<table>
<thead>
<tr>
<th>Role</th>
<th>Accountabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Manager (OM)</td>
<td>• Make appropriate resources available for the implementation of this AQGHGMP</td>
</tr>
</tbody>
</table>
| Environment and Community Manager (ECM)       | • Reviewing and updating the AQGHGMP in accordance with Project Approval and Development Consent Conditions  
• Ensure that the air quality and GHG management measures are implemented in accordance with this Plan  
• Ensure that the results of monitoring are communicated to senior management and to relevant personnel for consideration as part of ongoing mine planning  
• Ensure the NGERs Act reporting obligations are met by Austar  
• Communicate the NGERs reporting of energy usage to Austar personnel, and promote the identification and investigation of potential energy efficiency opportunities  
• Ensure all internal and external reporting requirements are met, including incident reporting  
• Liaise with government and community as required  
• Ensure effective management of all community complaints  
• Provide copies of updated management plans to CCC members and upload to the Austar Coal Mine website  
• Manage and maintain the air quality monitoring programs in accordance with this Plan  
• Ensure monitoring equipment is operated in accordance with relevant industry standards and protocols  
• Ensure that all monitoring records are effectively maintained on site in accordance with the EMS  
• Conduct periodic environmental inspections in accordance with the EMS to identify any air quality management issues  
• Coordinate incident investigation processes including associated reporting requirements, in accordance with the EMS  
• Coordinate the implementation of any corrective actions and evaluate their effectiveness |
| Ventilation Officer                            | • Coordinate the implementation of the air quality and GHG management controls with respect to the underground ventilation system                                                                                                           |
| Project Managers, Process Owners and Task Coordinators | • Implement air quality and GHG management measures for their process area or project  
• Ensure any potential or actual air quality or GHG management issues, including environmental incidents, are reported to the ECM  
• Ensure the effective implementation of strategies designed to reduce air quality and GHG impacts from the project                                                                 |
| All employees and Contractors                  | • Ensure any potential or actual air quality management issues, including environmental incidents, are reported to the Project Manager, Supervisor or Task Coordinator  
• Ensure equipment (relevant to task/area of responsibility) is maintained and operated in a proper and efficient manner                                                                                   |
8 References

Todoroski Air Sciences (September 2012) *Particulate Matter Best Management Practice Pollution Reduction Program*, Todoroski Air Sciences Eastwood NSW.

Umwelt (September 2008) *Ventilation Shaft Air Quality Impact Assessment*, Umwelt Toronto NSW.

Umwelt (September 2008) *Austar Coal Mine Project – Stage 3 Greenhouse Gas and Energy Assessment*, Umwelt Toronto NSW.

Umwelt (October 2008) *Austar Coal Mine Environmental Assessment Proposed Stage 3 Extension to Underground Mining and Associated Infrastructure*, Umwelt Toronto NSW.
Figures
Figure 2: Austar Air Quality Monitoring Network

Austar Owned Land

J. Chadwick
18/6/2018

C. McCormack

Environmental Monitoring Plan

Not to scale
Appendix A:
Approval Requirements
PROJECT APPROVAL REQUIREMENTS
Relevant conditions from the Project Approval, Development Consent and EPL and where these conditions are addressed in this Plan are listed in the tables below.

**TABLE 1: PROJECT APPROVAL CONDITIONS (08_0111)**

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Project Approval Conditions</th>
<th>Section of this Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>AIR QUALITY AND GREENHOUSE GAS</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Impact Assessment Criteria</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. The Proponent shall ensure that the dust emissions generated by the project do not cause additional exceedances of the air quality impact assessment criteria in:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Tables 3, 4 and 5 for <em>dust generated by the Surface Infrastructure Site</em>; and</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>(b) any relevant EPL, for dust generated by all other components of the project, at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.</td>
<td>Appendix A, Table 3, 2.4</td>
</tr>
<tr>
<td>4</td>
<td>Operating Conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. The Proponent shall:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) ensure that any visible air pollution generated by the project is assessed regularly and measures are taken to minimise air quality impacts on privately-owned land; and</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>(b) implement all reasonable and feasible measures to minimise the off-site odour and fume emissions generated by the mine complex’s ventilation system or any spontaneous combustion on the site, to the satisfaction of the Director-General.</td>
<td>2.4</td>
</tr>
<tr>
<td>4</td>
<td>Air Quality and Greenhouse Gas Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the mine complex, to the satisfaction of the Director-General. The plan must:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) be prepared in consultation with EPA, and be submitted to the Director-General for approval prior to the commencement of construction of the Surface Infrastructure Site (other than shaft construction referred to in Condition 1); and</td>
<td>1.3</td>
</tr>
</tbody>
</table>
### Schedule Project Approval Conditions Section of this Plan

(b) include, in addition to the standard requirements for management plans (see Condition 2 of Schedule 7):

- an air quality monitoring program providing for a combination of continuous monitors, high volume samplers and dust deposition gauges;
- an energy savings action plan, including a feasibility study into the capture and beneficial utilisation of methane gas emissions from the project; and
- a detailed continual improvement program for investigating, implementing and reporting on all reasonable and feasible measures to reduce dust generated by the mine complex.

<table>
<thead>
<tr>
<th>4</th>
<th>METEOROLOGICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>The Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the project in accordance with the requirements in <em>Approved Methods for Sampling of Air Pollutants in New South Wales</em> and to the satisfaction of the Director-General.</td>
</tr>
<tr>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

### 7 ENVIRONMENTAL MANAGEMENT Management Plan Requirements

2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:

(a) detailed baseline data;  

| 2.1 | 
| 3.2 | 

(b) a description of:

- the relevant statutory requirements (including any relevant approval, licence or lease conditions);
- any relevant limits or performance measures/criteria;
- the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;

| Appendix A | 2.2 | 3.3 |

(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;

| 2.4 | 3.4 |

(d) a program to monitor and report on the:

- impacts and environmental performance of the project;
- effectiveness of any management measures (see (c) above);

| 2.3 | 3.4 | 4.0 |

(e) a contingency plan to manage any unpredicted impacts and their consequences;

| 5.0 | 

(f) a program to investigate and implement ways to continually improve the environmental performance of the project over time;

| 2.4 | 3.4 |

(g) a protocol for managing and reporting any:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria; and

| 4.0 | 

(h) a protocol for periodic review of the plan.

| 6.0 |
### TABLE 2: DEVELOPMENT CONSENT CONDITIONS (DA 29/95)

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Project Approval Conditions</th>
<th>Section of this Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>AIR QUALITY</td>
<td>2.2</td>
</tr>
<tr>
<td>3</td>
<td>Impact Assessment Criteria</td>
<td></td>
</tr>
<tr>
<td>17. The Applicant must ensure that the <em>dust emissions generated by the Infrastructure Upgrade Area</em> identified in Figure 1.3 of the April 2006 SEE do not cause additional exceedances of the air quality impact assessment criteria listed in Tables 3, 4 and 5 at any residence on, or on more than 25 percent of, any privately-owned land.</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Table 3: Long term impact assessment criteria for particulate matter</strong></td>
<td></td>
</tr>
<tr>
<td>Pollutant</td>
<td>Averaging period</td>
<td>Criterion</td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Total suspended particulate (TSP) matter</td>
<td>Annual</td>
<td>90 µg/m³</td>
</tr>
<tr>
<td>Particulate matter &lt; 10 µm (PM₁₀)</td>
<td>Annual</td>
<td>30 µg/m³</td>
</tr>
<tr>
<td><strong>Table 4: Short term impact assessment criterion for particulate matter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollutant</td>
<td>Averaging period</td>
<td>Criterion</td>
</tr>
<tr>
<td>----------</td>
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<td>-----------</td>
</tr>
<tr>
<td>Particulate matter &lt; 10 µm (PM₁₀)</td>
<td>24 hour</td>
<td>50 µg/m³</td>
</tr>
<tr>
<td><strong>Table 5: Long term impact assessment criteria for deposited dust</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollutant</td>
<td>Averaging period</td>
<td>Maximum increase in deposited dust level</td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Deposited dust</td>
<td>Annual</td>
<td>2 g/m²/month</td>
</tr>
</tbody>
</table>

| 3        | Operating Conditions     | 2.4 |
| 18. The Applicant must: |                       |
| (a) ensure any visible air pollution generated by the development is assessed regularly, and measures taken to minimise air quality impacts on privately-owned land; and | 2.4 |
| (b) implement all reasonable measures to minimise the off-site odour, greenhouse gas and fume emissions generated by the mine’s ventilation system or any spontaneous combustion at the development, to the satisfaction of the Secretary. | 2.4 |
| 3        | Monitoring               | This Plan |
| 19. The Applicant must prepare an Air Quality Monitoring Program for the development to the satisfaction of the Secretary. This program must include an air quality monitoring protocol for evaluating compliance with the air quality impact assessment criteria in this consent. The Applicant must implement the approved program as approved from time to time by the Secretary. | This Plan |
| 3        | METEOROLOGICAL MONITORING| 2.3 |
| 20. The Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the development in accordance with the requirements in Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales and to the satisfaction of the Secretary. | 2.3 |
### TABLE 3: ENVIRONMENT PROTECTION LICENCE 416 (EPL 416)

<table>
<thead>
<tr>
<th>Section</th>
<th>Project Approval Conditions</th>
<th>Section of this Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>OPERATING CONDITIONS</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>O3 Dust</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.</td>
<td>2.4</td>
</tr>
<tr>
<td>5</td>
<td>MONITORING AND RECORDING CONDITIONS</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M4 Weather Monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M4.1 The meteorological weather station must be maintained so as to be capable of continuously monitoring the parameters specified in condition M4.2.</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>M4.2 For each monitoring point specified in the table below the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Note: The rainfall monitoring data collected in compliance with Condition M4.2. can be used to determine compliance with L1.2.</td>
<td>2.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units of Measure</th>
<th>Frequency</th>
<th>Averaging Period</th>
<th>Sampling Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Temperature</td>
<td>Degrees Celsius</td>
<td>Continuous</td>
<td>1 hour</td>
<td>AM-4</td>
</tr>
<tr>
<td>Wind direction</td>
<td>Degrees</td>
<td>Continuous</td>
<td>15 minute</td>
<td>AM2 &amp; AM-4</td>
</tr>
<tr>
<td>Wind speed</td>
<td>m/s</td>
<td>Continuous</td>
<td>15 minute</td>
<td>AM-2 &amp; AM-4</td>
</tr>
<tr>
<td>Sigma theta</td>
<td>Degrees</td>
<td>Continuous</td>
<td>15 minute</td>
<td>AM-2 &amp; AM-4</td>
</tr>
<tr>
<td>Rainfall</td>
<td>mm</td>
<td>24 hours</td>
<td>Standard rain gauge</td>
<td></td>
</tr>
</tbody>
</table>

Point 7
STATEMENT OF COMMITMENTS
A list of the Statement of Commitments from Project Approval 08_0111 which are relevant to this Plan are provided in Table 4.

Table 4: Project Approval Statement of Commitments (08_0111)

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Statement of Commitments</th>
<th>Section of this Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td><strong>1.9 AIR QUALITY</strong></td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>1.9.1 Austar Coal Mine will manage operations associated with the operation of the Surface Infrastructure Site so that dust deposition as a result of the development does not exceed levels set out in Table 1.2 at nearest non-project related residences.</td>
<td>2.3</td>
</tr>
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<td></td>
<td></td>
<td>2.4</td>
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<td></td>
<td>1.9.2 Austar Coal Mine will expand the existing dust monitoring network to include dust deposition gauges at locations to the south and north of the proposed Surface Infrastructure Site. Dust monitoring findings relating to the Surface Infrastructure Site will be reported annually in the Annual Review.</td>
<td>2.3</td>
</tr>
<tr>
<td>3</td>
<td><strong>1.10 ENERGY AND GREENHOUSE GAS</strong></td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>1.10.1 Austar Coal Mine will develop and maintain an internal energy and GHG management plan for Stage 3 operations in accordance with Austar Coal Mine requirements. This will include reviewing:</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>● energy efficiency in plant and equipment procurement, consideration be given to the life cycle costs advantages obtained by using energy efficient components;</td>
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<td></td>
<td>● the opportunity to install additional sub-metering for offices, workshops and winders;</td>
<td></td>
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<td></td>
<td>● operational initiatives such as turning off idling plant equipment;</td>
<td></td>
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<td></td>
<td>● control and temperature settings for air conditioning units in offices and switchrooms;</td>
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<td></td>
<td>● automatic control of external and internal lighting;</td>
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<tr>
<td></td>
<td>● potential energy efficiency opportunities in water pumping and dust suppression systems (for example, variable speed drive pumps);</td>
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<tr>
<td></td>
<td>● review changes in power consumption with installation of new equipment and install power factor correction equipment to suit; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● review workshop and bathhouse lighting and office and high bay lighting.</td>
<td></td>
</tr>
<tr>
<td>Appendix</td>
<td>Statement of Commitments</td>
<td>Section of this Plan</td>
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</tr>
<tr>
<td>3</td>
<td><strong>1.15 CONTINUOUS IMPROVEMENT OF EXISTING OPERATIONS</strong></td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>1.15.5 Austar Coal Mine will investigate opportunities for reduction in energy use and greenhouse gas emissions from the Austar Mine Complex. This will include:</td>
<td></td>
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<td></td>
<td>• ongoing review of emissions monitoring and management technology;</td>
<td></td>
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<tr>
<td></td>
<td>• review of coal operations and potential for improvement as part of producing clean coal through coal preparation to reduce moisture and ash content, sulphur, nitrogen and other contaminants. This results in reduced emissions of greenhouse gases and other pollutants when the coal is used; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• consider the application of the in-force National Greenhouse and Energy Reporting System (NGERS) and the Carbon Pollution Reduction System (CPRS) on Austar operations.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Consultation
Mr Gary Mulhearn  
Environment & Community Manager  
Austar Coal Mine Pty Limited  
Locked Bag 806  
CESSNOCK NSW 2325  

Attention: Gary Mulhearn  gary.mulhearn@yancoal.com.au

Dear Mr Mulhearn

Environment Protection Licence 416  
Austar Coal Mine - Environmental Management Plans

Thank you for your email of 28 April 2017 providing to the Environment Protection Authority (EPA) a number of environmental management plans for Austar Coal Mine (Austar). These plans included the Air Quality and Greenhouse Gas Management Plan, Site Water Management Plan and Noise and Vibration Management Plan.

The EPA encourages the development of such plans to ensure that proponents have met their statutory obligations and environmental objectives. However, the EPA does not review these documents as our role is to set environmental objectives for environmental/conservation management and marage outcomes.

The EPA has not read or reviewed this document and accordingly offers no comments in relation to it.

If you wish to discuss this matter further, please contact me on 02 4908 6891.

Yours sincerely

JENNY LANGE  
Regional Opertions Officer - Hunter  
Environment Protection Authority

Contact officer: JENNY LANGE  
4908 6891