

22 May 2018

Senior Planning Officer
Independent Planning Commission NSW
GPO Box 39
SYDNEY NSW 2001

Attention: Mr Bradley James

Dear Brad,

**Dartbrook Mine
Modification to DA 231-7-2000**

1. INTRODUCTION

AQC Dartbrook Management Pty Limited (AQC) is the owner of the Dartbrook Mine in the Upper Hunter Valley of New South Wales (NSW). Dartbrook Mine is managed in accordance with Development Consent DA 231-7-2000. AQC is seeking a minor modification to DA 231-7-2000 to facilitate the reinvigoration of underground mining operations at Dartbrook Mine. The Modification is currently being assessed by the Independent Planning Commission (IPC).

On 9 May 2019, the IPC issued a letter to the Department of Planning and Environment (DPE) requesting further information on the following matters:

- Economics;
- Mine safety;
- Groundwater;
- Equine Critical Industry Clusters; and
- Air quality.

Reference was also made in this letter to various submissions to the IPC over the Modification Application from the Hunter Thoroughbred Breeders Association (HTBA) and others.

Whilst the letter was addressed to the DPE, AQC provides this submission to restate earlier positions and to provide further context where applicable for the five areas of inquiry and to highlight some of the significant weaknesses contained in several of the submissions listed in the IPC letter.

It is noted that AQC can recommence mining under existing approvals and the Modification specifically seeks minor variations as part of the recommencement. A significant portion of the commentary from groups against the Modification is in relation to recommencing mining rather than the minor variations contained in the Modification.

Section 2 responds specifically to the five matters raised and advice sought. **Section 3** of this letter provides comment on the various submissions listed in the IPC's letter to DPE. **Section 4** provides a conclusion.

2. RESPONSES TO IPC REQUEST FOR INFORMATION

2.1 ECONOMICS

The IPC has queried the DPE on several elements of the Modification cost benefit analysis (CBA). Various submissions by technical experts, particularly those engaged by the HTBA, commented on the CBA. A common misconception is that the mine plan and other key inputs for the Modification are materially consistent with the earlier underground feasibility study and reserves statement (2017 FS) published in March 2017 by AQC. This is not the case and this correction has been clearly stated by AQC in its submissions to date.

AQC's response to each query is noted below. Some of the IPC queries have been grouped given the interrelationship.

Coal price and quality assumptions

In relation to coal quality, Table 1 of the AQC Response to Submission (RTS) states that the proposed mining operations will target the highest quality coal plies within the Kayuga Seam. The in-situ ash content for these plies varies from 9-24%. Based on the in-situ coal quality of these plies, the Modification will produce a coal product ranging from 15-24% ash and averaging 5,500 kcal/kg energy content. References by HTBA to the 2017 FS and coal qualities of that study are not able to be directly correlated with the activities proposed by the Modification.

Coal price forecasts for a coal mine producing export quality coal (such as Dartbrook) include both an estimate of future United States Dollars (USD) pricing terms and the Australian Dollar (AUD) to USD exchange rate to deliver anticipated AUD revenues. In the Environmental Assessment supporting the Modification (MOD 7 EA), AQC presented a long term USD:AUD exchange rate of 0.77 and a 73 USD realised coal price per tonne which equates to AUD 95 per tonne.

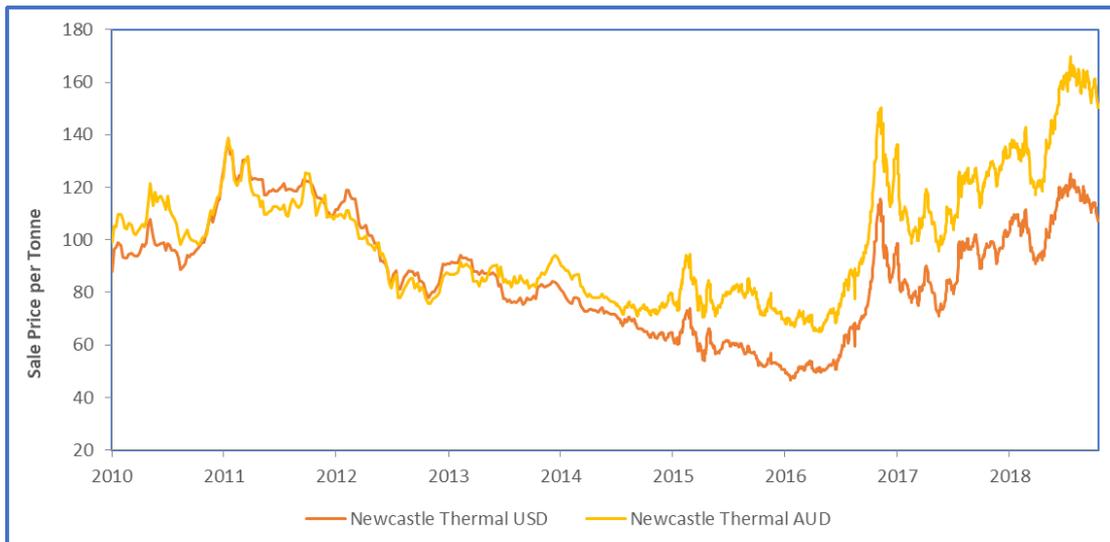
It should be noted there are many organisations that provide forecasts for coal pricing and there is a wide range of views on the topic. Recent actual pricing levels for coal highlight the range of prices received but also demonstrate the structural upward pricing shift observed in export thermal coal markets in recent years.

For example, in calendar year 2018, the AUD achieved price for the Newcastle 6,000 kcal/kg benchmark specification ranged¹ from around AUD 115 to 180 per tonne, averaging AUD 145 per tonne. The Modification contemplates producing a 5,500 kcal/kg energy content that has historically traded at a discount of 15-30%¹ of the Newcastle 6,000 kcal/kg benchmark. Whilst this produces a large implied range of prices for coal produced for the Modification, it can be seen that the assumed price of AUD 95 is not an unreasonable view given recent and historical observed pricing.

To further note this point, the present USD:AUD exchange rate is 0.6878 (www.rba.com.au as of 21 May 2019) which, all other things being equal, would produce a 12% higher AUD achieved price against the assumption used within the MOD7 EA.

¹ Platts Daily Price Index and globalCoal

Figure 1: Newcastle Historical Thermal Price



Sources: Platts and Reserve Bank of Australia (2019)

Tax, royalty and VPA payments

AQC considers these matters are addressed through the assessment of coal price and quality assumptions, capital cost assumptions and the head count for the operation given the calculations of these benefits are largely interdependent with these matters. As noted in Table 1, there is the potential for an upside in benefits above those stated in the CBA through a strong thermal export market and softer AUD which flows through to royalties (revenue-linked) and taxes. The DPE noted in their Assessment Report that the key source of benefits to NSW is coal royalties which are linked to revenue generated from the sale of export coal.

In respect of VPA payments, AQC notes that arrangements with both the Upper Hunter Shire Council (UHSC) and Muswellbrook Shire Council (MSC) are already in place and that all payments have been made to account to the end of the current approval period, being December 2022. In negotiating these new, arms' length agreements with each council, AQC has in good faith agreed to bring forward the commencement of payments under the new VPA arrangements to align with the approval of the Modification, rather than from December 2022.

Capital cost assumptions, head count for operation

The capital cost and head count assumptions for the Modification was developed by AQC's consultants and technical specialists using a first principles approach. AQC has considered certain arrangements with contractors whereby the contractor contributes items of equipment or facilities some capital contributions as part of its site contract and return profile. Whilst these arrangements are not yet finalised, AQC is comfortable that the capital cost and operating costs appropriately capture these potential arms' length arrangements and will continue discussions with various counterparties in the preparation for commencement of mining.

Site rehabilitation costs

AQC notes that under the Mine Operations Plan (reviewed and accepted by the NSW Government for the period 1 January 2018 through to 31 December 2018), there is an agreed rehabilitation cost assessment of \$8.9 million which includes provision for the removal of infrastructure and rehabilitation of the entire mine site. In accordance with the conditions of the mining authorities, AQC has deposited this cash amount with the NSW Government.

As an underground mine, Dartbrook's incremental impacts will be related to the reinstatement of surface infrastructure and other equipment. Dartbrook's Mine Operations Plan will be reviewed and re-approved by DPE in consideration of the modification sought prior to any recommencement of mining.

Greenhouse gas emissions

AQC notes that further information was provided to the IPC on 23 April 2019.

Minimal or no costs for impacts (greenhouse gas, amenity, health agricultural and equine industries)

The CBA provided assessment against current approved activities to determine the incremental impact of MOD 7. Economic consideration of externalities first relies on technical specialists to identify the potential physical impacts of proposals. Only once physical impacts are identified can economists attempt to place a value on them. The CBA considered each of these elements in the MOD 7 EA and described the sub-consultant experts work and assessment. Biophysical assessments of the Modification identified insignificant residual biophysical impacts after mitigation, compensation and offset and hence there are minimal negative economic impacts for inclusion in the CBA.

Costs associated with the reopening and operation of the coal washery

AQC completed a 2017 Feasibility Study which contemplated the reopening of the washery, albeit adopting a different mine plan and overall approach. The study estimated an operating cost of less than \$6 per tonne with full reinstatement of facilities estimated to be a capital cost of approximately \$10 million.

2.2 MINE SAFETY

The historical safety incidents associated with the mine are well understood and whilst one can never provide absolute guarantees that future events will not occur, significant controls exist to reduce harm to people both in the underground and surface environments. AQC notes that further information was provided to the IPC on 23 April 2019 in relation to previous safety incidents that were non direct mining specific as purported to be by several opponents to the modification.

The mine will be managed under a comprehensive and specifically developed Safety and Health Management System (SHMS) in accordance with core legislative requirements. Within this framework, Principal Hazard Management Plans (PHMP's) are a driving factor in reducing the risks and hazards deemed to have a higher propensity to result in significant injury or fatalities.

The SHMS will specifically critique and address all aspects of the operation. It will identify any relevant exposures and ensure controls are in place to mitigate any health and safety risks. Where existing controls are deemed inadequate, additional controls will be implemented. The appointed operator will ultimately review and deem the residual risk acceptable or otherwise.

Under the SHMS the guidelines include:

- Training and Competency;
- Communication and Engagement;
- Risk and Change Management;
- Incident Management;
- Health and Occupational Hygiene;
- Principle Hazard Management Plans;
- Document Control;
- Plant, Equipment and Infrastructure Management;
- Monitoring and Review; and
- Emergency Response and Business Continuity.

The Mining Operations Plan (mandated submission prior to mining recommencement) details the specific environmental management plans that demonstrate the commitment to compliance requirements for the operation. The frequency of detailed assessment and measurement of many environmental facets is specified within each environmental management plan for reporting purposes.

In relation to spontaneous combustion concerns, gas monitoring technology has improved significantly since the Dartbrook Mine was placed into care and maintenance in 2006. This has increased the accuracy of monitoring significantly which allows for earlier detection of potential spontaneous combustion events – making them far easier to manage and mitigate.

The implementation of computer fluid dynamic modelling allows for improved calculation of gas make from the mining process. The new modelling has been validated using the mines historical operational data. This information assists in the design and implementation of the mines specific ventilation plan on a section by section basis to ensure gas levels are managed and risks mitigated.

The anticipated volume of gas is well understood and forms the basis for many mine design aspects as referenced above. Furthermore, key members of the management team have worked in underground mines which are considered to be high in gas (and water) (in the Bowen Basin and the Western NSW coal fields) and as such, have significant on the ground experience in these areas.

The installation of the “mine shaft” is another area that is common-place in modern underground mines. The process, stability and upkeep requirements of such infrastructure are well understood. As previously indicated, should a significant flood event occur (1% AEP), a steel plate suitable for capping the shaft would be installed. The mine will operate its activities using dedicated Trigger Action Response Plans (TARPs) to manage operational and safety risks. As such, the potential risk to personnel due to a rain event is extremely low as the TARPs to be implemented provide specific staged controls for any number of potential scenarios.

2.3 GROUNDWATER – DEPARTMENT OF INDUSTRY – WATER

Proposed Shaft

AQC has consulted with the Department of Industry – Crown Lands and Water Division (DoI – Water) during the preparation of the MOD 7 EA and assessment of the Modification. In particular, AQC attended a face-to-face meeting with DoI – Water on Wednesday, 4 April 2018 at their Newcastle offices. At this meeting, DoI – Water was given a detailed briefing regarding the Modification, including the location of the proposed shaft from the surface to the Hunter Tunnel.

Section 8.3.3 of the MOD 7 EA committed to the lining of the shaft, if groundwater is found to be present at the proposed shaft location. DoI – Water reviewed the MOD 7 EA and provided a submission, which did not suggest any additional mitigation measures relating to the proposed shaft. In response to other submissions on the MOD 7 EA, AQC committed to conducting a test bore at the proposed shaft site as an additional safeguard. As described in Section 2.6.11 of the RTS, this test bore will be installed prior to construction to determine if groundwater is present. This test bore will inform the shaft construction technique to safeguard against any potential for excessive seepage of groundwater from the shaft into the Hunter Tunnel.

DoI – Water has subsequently reviewed the RTS and provided a submission (dated 30 October 2018) stating that:

“The department has reviewed the proposal and has no comments. The RTS has adequately addressed matters of interest previously raised by the department.”

Aquifer Interference Approval

As explained in Section 3.2.9 of the RTS and our submission to the IPC (dated 23 April 2019), the requirement for an Aquifer Interference Approval has not commenced. If this provision commences in the future, AQC will consult with DoI – Water regarding both the need for and the process for obtaining an Aquifer Interference Approval.

2.4 IMPACT ON UPPER HUNTER EQUINE CRITICAL INDUSTRY CLUSTER

Mapped Equine Critical Industry Cluster

There is an area of land mapped as Equine Critical Industry Cluster (ECIC) overlying the Approved Kayuga Seam Mining Area. The ECIC mapping was introduced in October 2013 as part of the amendment to *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP). That is, importantly the ECIC mapping post-dates the granting of a development consent (DA 231-7-2000) and mining lease (ML1497) that permits underground mining beneath that land.

The land mapped as ECIC does not currently support any equine enterprises and AQC is not aware that a commercial equine enterprise has previously operated on that land.

Impacts of Proposed Bord and Pillar Mining

The Modification proposes bord and pillar mining (as an alternative) beneath the eastern portion of the area of mapped ECIC. As explained in Section 8.5.3 of the EA, the coal pillars will be designed to remain stable in the long term. Subsidence associated with bord and pillar mining is proposed to be less than 80 mm as per Appendix F authored by SCT Operations in the MOD 7 EA. Subsidence of this magnitude is imperceptible and will not affect the suitability of the land for any agricultural purposes.

The proposed bord and pillar mining will result in lower levels of subsidence than the approved longwall mining activities.

Accordingly the Modification is not expected to result in any additional impacts to the ECIC mapped within this area.

Impacts of Approved Longwall Mining

DA 231-7-2000 and ML1497 allows for longwall mining of the Kayuga and Piercefield Seams below this area of mapped ECIC. The potential impacts of the approved longwall mining were assessed in the *Dartbrook Extended Environmental Impact Statement* (HLA-Envirosciences, 2000) (EIS), which accompanies DA 231-7-2000. No mining has been undertaken beneath the area of mapped ECIC to date.

Longwall mining of the Wynn Seam and Kayuga Seam has been completed in other parts of Dartbrook Mine. The previous longwall mining activities have not precluded the ongoing use of the land surface for the same agricultural purposes (i.e. the Garoka Dairy). Mr Butch Smith, the owner/operator of the Garoka dairy spoke at the IPC Meeting and described his experiences with former mine owners whilst the mine was operating. Mr Smith's business successfully coexisted while the mine was operating and has continued to do so since the mine was placed on care and maintenance. There is no reason that during and following the approved longwall mining that the locality cannot support equine and or other agricultural enterprises as is evidenced by the fact that the majority of AQC's land holdings have previously and are currently (and are proposed to continue to be) used for agricultural purposes. AQC has intentions to expand its plans for developing an agriculture business on AQC owned land upon granting of MOD 7.

The AQC owned private coal haul road is proposed to remain a key road access link for the transport of agricultural produce and livestock between the areas to the west of Dartbrook (including the area of identified ECIC) and the Upper Hunter Valley's livestock markets and veterinarian facilities.

2.5 CUMULATIVE IMPACT OF AIR POLLUTION

Conditions to Monitor and Manage Cumulative Air Quality Impacts

Condition 6.1 of Schedule 2 of DA 231-07-2000 has been recommended to the IPC to be contemporised such that air quality management and monitoring at the mine site meets all best practice NSW Government Policies and Guidelines. This includes a consideration of cumulative air quality monitoring and management.

In particular Condition 6.1 (a) requires the applicant to ensure all reasonable and feasible avoidance and mitigation measures are employed to ensure that particular matter generated by the development do not cause any exceedances of NSW Government policies and guidelines pertaining to air quality at private receivers. These guidelines specify both Project alone and cumulative (from all sources) criteria for coarse and fine particulate matter.

Condition 6.1 (e) (i to vi) specifies that:

“(e) The Applicant must:

- (i) take all reasonable steps to minimise odour, fume, spontaneous combustion, greenhouse gas and dust (including PM₁₀ and PM_{2.5}) emissions of the development;*
- (ii) minimise any visible off-site air pollution generated by the development;*
- (iii) minimise to the greatest extent practicable, the extent of potential dust generating surfaces exposed on the site at any given point in time;*
- (iv) ensure all ROM coal and dust-prone surfaces are watered and kept sufficiently moist to prevent or minimise emissions;*
- (v) operate an air quality management system commensurate with the risk of impact to ensure compliance with the relevant conditions of this consent;*
- (vi) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note c to Table 5 above); ...”*

Further to the above Condition 6.1 (f) (i to iv) specifies that:

“(f) The Applicant must, prior to the recommencement of construction or Mining Operations, prepare an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Secretary. This plan must:

- (vii) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;*
- (viii) describe the measures to be implemented to ensure:*
 - compliance with the air quality criteria and operating conditions in this consent;*
 - best practice management is being employed; and*
 - the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;*
- (ix) outline mitigation measures to be employed to minimise dust emissions including dust from rejects emplacement area in dry and windy conditions;*
- (x) (iv) describe the air quality management system in detail; and ...”*

Condition 6.1 (c) (vii) requires the Applicant to carry out regular monitoring to confirm compliance with all of the relevant air quality management conditions discussed above.

Condition 6.1 (c) (ix) requires operations to be modified to ensure compliance with the relevant NSW Government criterion for both Project alone and cumulative air particulate criteria.

Condition 6.1 (f) (v) requires that an air quality monitoring program is installed and operated at the mine site to the satisfaction of the Secretary of the DPE. This air quality monitoring program will be required to monitor the cumulative impacts of particulate matter at the Projects closest private receivers. The air quality monitoring program is specified as follows:

- (xi) *“include an air quality monitoring program that:*
- uses monitors to evaluate the performance of the development against the air quality criteria in this consent and to guide day to day planning of operations;*
 - adequately supports the air quality management system; and*
 - includes a protocol for identifying an air quality-related exceedance, incident or non-compliance and notifying the Department and relevant stakeholders of any such event.”*

The Upper Hunter Air Quality Monitoring Network (UHAQMN) is a network of high quality ambient-air monitoring sites. These sites are situated at strategic locations around Upper Hunter mining areas and populated centres, including Muswellbrook, Singleton and Aberdeen. The UHAQMN is regulated by the EPA to provide continuous measurement of dust particulates in the air, including PM₁₀ and PM_{2.5}. Results from the network are assessed against the ‘National Environment Protection (Ambient Air Quality) Measure’ (NEPM) goals and are used by NSW regulatory agencies to inform decision making and review performance against the actions identified in the ‘Upper Hunter Air Particles Action Plan’ (EPA, 2013) to reduce air quality particulate impacts.

The UHAQMN will continue to inform the NSW Government over the appropriate management and mitigation measures which should be applied to anthropogenic dust sources.

Exceedances of Air Quality Criteria

The recommencement of underground mining as proposed at Dartbrook will have an immaterial impact on the cumulative air quality at private receivers and will likely be immeasurable.

There is a plethora of air quality monitoring data collected in the Upper Hunter Valley airshed. The vast majority of this is publicly available. The most robust and definitive contemporary dataset is that from the UHAQMN. DPE is on the Upper Hunter Air Quality Monitoring Network Advisory Committee. The UHAQMN was established in 2012. Data collected to date is available at <https://www.environment.nsw.gov.au/topics/air/upper-hunter-air-quality-reports>.

A review of any air quality monitoring data set will identify exceedances of air quality goals. In the air shed in question, identified exceedances are most typically due to bushfire, significant state-wide dust storms in dry conditions and the wide-spread use of wood fire heaters in the winter months when temperature inversions are prevalent.

The most important factor to consider when analysing this data is the timing of the recorded exceedances. Data from the UHAQMN reflects the particulate concentrations due to all sources (i.e. not limited to mining sources). Interrogation of the data from the closest monitor to Dartbrook Mine, the ‘Aberdeen’ monitor shows:

- 2015 1 exceedance of daily PM₁₀ benchmarks (50 µg/m³) – caused by state-wide dust storm;
- 2016 no exceedances of daily PM₁₀ benchmarks (50 µg/m³);
- 2017 2 exceedances of daily PM₁₀ benchmarks (50 µg/m³) – both were caused by state-wide bushfires; and
- 2018 7 exceedances of daily PM₁₀ benchmarks (50 µg/m³) – all of which were attributable to state-wide bushfires and dust storms; and

- 2019 6 exceedances of daily PM₁₀ benchmarks (50 µg/m³) to end March 2019 – The OEH annual report is not yet available to review, however the January, February and March exceedances (4 of the 6) appear to be derived from state-wide dust storms, as per OEH's comments.

In summary, for all years from 2015 to 2018, all exceedances were attributed to state-wide dust storms or bushfires. When an analysis of the 2019 data is complete, it is highly likely that it will also determine that extraordinary events will be the cause of the potential exceedances. As such, this data does not represent "frequent and significant exceedances of air quality in the airshed" pertaining to anthropogenic land uses in the locality.

For completeness a discussion on each identified exceedance is provided below.

- 2015: 1 exceedance of daily PM₁₀ benchmarks (50 µg/m³);
 - From raw data on UHAQMN website: 64.8 on 6/5/2015

The most extensive event occurred on 6 May 2015 when all 14 sites recorded levels over the PM₁₀ benchmark. Particle levels on this day were affected by a state-wide dust storm² originating from the Victorian Mallee and south-western NSW regions on 5 May, and transported by the passage of a cold front. Elevated particle levels were recorded in most NSW regions on 6 May, reaching the Upper Hunter early in the morning under south-west to north-west winds. Daily PM₁₀ concentrations in the valley ranged from 60.6 to 86.7 µg/m³ on this day. More information on this event can be found in Upper Hunter air quality monitoring network autumn 2015 seasonal newsletter. (*UH AQ monitoring network: 2015 annual report pg 7*).
- 2016: no exceedances of daily PM₁₀ benchmarks (50 µg/m³);
- 2017: 2 exceedances of daily PM₁₀ benchmarks (50 µg/m³);
 - From raw data on UHAQMN website: 59.4 on 12/2/2017

The most extensive PM₁₀ event occurred on 11 and 12 February when Aberdeen, Camberwell, Maison Dieu, Mt Thorley, Muswellbrook, Muswellbrook NW, Warkworth and Wybong all recorded levels over the benchmark on at least one of these days. There were several fires burning and smoke reported in or near the region during this period. (*UH AQ monitoring network: Summer 2016-17 pg 1*)

 - From raw data on UHAQMN website: 53.3 on 15/12/17

The larger population sites recorded PM₁₀ levels over the benchmark on 15 December and 23 January (Aberdeen and Muswellbrook) and 15 February (Aberdeen, Muswellbrook and Singleton). These were all exceptional events, due to smoke from bushfires and/or long-range dust transport. (*UH AQ monitoring network: Summer 2017-18 pg 1*)
- 2018: 7 exceedances of daily PM₁₀ benchmarks (50 µg/m³); and
 - From raw data on UHAQMN website: 50.4 on 23/1/2018

The larger population sites recorded PM₁₀ levels over the benchmark on 15 December and 23 January (Aberdeen and Muswellbrook) and 15 February (Aberdeen, Muswellbrook and Singleton). These were all exceptional events, due to smoke from bushfires and/or long-range dust transport. (*UH AQ monitoring network: Summer 2017-18 pg 1*)

 - From raw data on UHAQMN website: 62.9 on 15/2/18

The most extensive event occurred on 15 February. On this day, 37 air quality monitoring stations in the NSW network recorded PM₁₀ levels over the benchmark. The Upper Hunter was impacted by long-range dust transported from the state's west and a large fire in Wollemi National Park^{1,2}. (*UH AQ monitoring network: Summer 2017-18 pg 1*)

- From raw data on UHAQMN website: 54.9 on 19/3/18
- From raw data on UHAQMN website: 58.7 on 20/3/18
- From raw data on UHAQMN website: 72.9 on 15/4/18

The most extensive events occurred on 19 March and 15 April, being exceptional events due to long-range dust transport.

- On 19 March, 35 air quality monitoring stations in the NSW network recorded PM₁₀ levels over the benchmark. A dust storm was reported on 18 March¹ through Canberra, travelling out to the east coast and impacting the Upper Hunter from later that night under south east winds.
- On 15 April, PM₁₀ levels over the benchmark were recorded at all Hunter air quality monitoring stations along with Tamworth, Gunnedah and Narrabri. The region was impacted by long-range dust from the State's west on this day. More details on this event are found in a section below. (*UH AQ monitoring network: Autumn 2018 pg 1*)

- From raw data on UHAQMN website: 178.9 on 22/11/18
- From raw data on UHAQMN website: 126 on 23/11/18

Most of NSW continued to be drought-affected (Figure 3), with widespread dust storms continuing¹. The most extensive events occurred on 21–23 November, being exceptional events due to long-range dust transport. All sites in the region exceeded the PM₁₀ benchmark during this dust event.

- On 22 November 44 of the 47 air quality monitoring stations in the NSW network recorded PM₁₀ levels over the benchmark. A dust storm originated from South Australia and drought-affected regions in NSW on 21 November. More information on this event can be found in the NSW Annual Air Quality Statement 2018. (*UH AQ monitoring network: Spring 2018 pg 1*)

- 2019: 6 exceedances of daily PM₁₀ benchmarks (50 µg/m³), year to date. (note: no reports from the monitoring network available for 2019)

- From raw data on UHAQMN website: 61 on 16/1/19
January 2019 was the dustiest January in our records dating back to 2005. In fact, it was the dustiest month ever measured (Figure 1). This was caused by a combination of very low groundcover across both grazing and cropping country and increased hours of strong winds (> 40km/h). (*DustWatch Report January 2019*)

- From raw data on UHAQMN website: 62.6 on 10/2/19
- From raw data on UHAQMN website: 94.2 on 13/2/19
- From raw data on UHAQMN website: 56.9 on 19/2/19

February 2019 was the dustiest February in our records dating back to 2005 (Figure 1). Many severe thunderstorms caused local dust throughout the month. A massive statewide dust storm added to the hours of dust on 12 and 13 February 2019, causing air quality alerts in the east of the State. (*DustWatch Report February 2019*)

- From raw data on UHAQMN website: 63.5 on 6/3/19
- From raw data on UHAQMN website: 64.7 on 31/3/19

March 2019 was the dustiest March since DustWatch records began in 2005. This dust is caused by the very low groundcover across much of NSW coupled with stronger than average wind conditions. In fact, the groundcover values are the lowest values for the month of March since MODIS records commenced in 2001 in many natural resource management (NRM) regions. Dust storms occurred evenly throughout the month and across most sites (*DustWatch Report March 2019*).

3. SUMMARY RESPONSE TO SUBMISSIONS LISTED IN IPC'S LETTER

This section provides a response to each of A-G of the 'Attachments' section in the IPC letter.

3.1 ATTACHMENT A - UPPER HUNTER SHIRE COUNCIL

Issue	Response
The economics assessment overestimates thermal coal prices	Refer to Section 2
Predicted company tax benefits will not eventuate	Refer to Section 2
Safety risks posed by gas levels, spontaneous combustion	Refer to Section 2
Air quality in Aberdeen is beyond the 'tipping point'	The air quality modelling predicts that cumulative levels at Aberdeen are predicted to remain within the criterion when emissions associated with the Modification are included. Whilst exceedances of annual average PM ₁₀ criterion have been measured at other locations in the Hunter Valley, PM ₁₀ concentrations at Aberdeen remain within the criterion.
Indirect greenhouse gas emissions have not been estimated and accounted for in the economics assessment	This was addressed in Sections 3.1.5 and 3.1.6 of the AQC's submission dated 23 April 2019.
Impacts on water security of the region	UHSC was concerned about the impacts that would occur if AQC used its full licensed allocation. As evidenced by past performance, operational water demands are satisfied predominantly using recycled mine water. AQC will not extract raw water from external sources unless necessary. AQC's licensed allocation does not reflect the actual demand for raw water. Further, the Modification Application being assessed will not result in any further water being drawn from the Hunter River Regulated Water Source.
The Hunter Tunnel should be used instead of the proposed truck haulage route to reduce visual impacts	This was addressed in Sections 3.1.2 of AQC's submission dated 23 April 2019. AQC retain the right to use the hunter tunnel coal clearance system under the current approved consent.
Drainage of water from the proposed shaft site	Appropriate erosion and sediment controls will be maintained at the proposed shaft site during both construction and operations. The Site Water Management Plan will be updated in accordance in Condition 4.1 of DA 231-7-2000 to include sediment controls required for the Modification.
Enlargement of the rail loop due to longer train lengths	The Modification does not involve an increase in the current approved coal production rate. As such, the trains used for the Modification will not need to be longer than the trains that are used for previous operations at Dartbrook Mine. No alterations of the rail loop are required for the Modification.

3.2 ATTACHMENT B – MICHAEL WHITE

Issue	Response
Coal produced by the Modification will not meet the quality specifications for a Newcastle 5,500 NAR product	This issue was addressed in Section 4.11.1 of AQC's submission dated 23 April 2019. The proposed bord and pillar mining will target the plies within the Kayuga Seam that have lower in-situ ash contents. Mining of these plies will yield coal that meets the ash specifications of a Newcastle 5,500 NAR product.
Operation of the washery has not been considered in the air quality, noise and water assessments	The proposed target coal quality can be achieved without use of the washery. As such, the Modification does not expect washing of coal extracted from the Kayuga Seam via bord and pillar mining methods. Importantly AQC

	are not seeking to vary the current consent and retain the right to use the washery under the current approved consent.
The Kayuga Entry conveyor, radial stacker, stockpiles and conveyor transfers have not been included in the air quality assessment	All coal handling activities involved in the Modification have been included in the dust dispersion model, as outlined in Appendix C of the Air Quality Assessment (Appendix B of the EA)
The economic assessment has overestimated coal prices and underestimated capital costs	Refer to Section 2
The operational workforce for the Modification has been underestimated	Refer to Section 2

3.3 ATTACHMENT C – OWEN DROOP

Issue	Response
A climatic-based water balance model has not been undertaken for the Modification.	This issue was addressed in Section 4.5.2 of AQC's submission dated 23 April 2019.
The water balance has not considered use of the washery.	Coal extracted from the Kayuga Seam via bord and pillar methods is not expected to be washed. Importantly AQC are not seeking to vary the current consent and retain the right to use the washery under the current approved consent.
If drought conditions similar to the 1940s were to reoccur, water licence allocations will be reduced to nil for twelve consecutive years.	AQC have large volumes of water stored in the Wynn seam goaf. Previous experience indicates that Dartbrook Mine is generally not reliant on raw water from the Hunter River. Poorer quality hard rock aquifer groundwater inflows are reused onsite for operational purposes. There is a large volume of water stored in the Wynn Seam goaf (approximately 2.5 GL) which can be used to satisfy all operational water demands. Therefore, Dartbrook Mine has a substantial contingency water source in the event of drought.
Flood risks have not been assessed.	Flood risks associated with the proposed shaft were addressed in Section 2.12.3 of the RTS and the Additional Information (letter to DPE dated 12 October 2018).
No quantification of impacts to groundwater systems.	Potential groundwater impacts were assessed using an analytical groundwater model. This groundwater model was described in Appendix D of the EA and was endorsed by an independent peer reviewer (refer to Appendix E of the EA).
Impacts on weathered bedrock aquifers have not been assessed.	The analytical groundwater model predicted that groundwater seepage into the proposed Kayuga Seam workings will be minimal (<20 ML/year). The resulting depressurisation effects on groundwater systems (including the shallow bedrock aquifer) will similarly be immaterial.

3.4 ATTACHMENT D - ENVIRONMENTAL JUSTICE AUSTRALIA

Issue	Response
PM ₁₀ is a better indication of mining impacts than PM _{2.5} concentrations, as the latter is more indicative of fine particles emitted by combustion processes.	PM ₁₀ emissions due to the Modification were assessed using dust dispersion modelling (refer to Appendix B of the EA). Cumulative PM ₁₀ concentrations are predicted to be less than the annual average criterion at all private residences.
Best practice dust controls are currently not being implemented by coal mines	EJA referenced the "NSW Coal Mining Benchmarking Study: International best practice measures to prevent and/or minimise emissions of particulate matter from coal mining" (Katestone Environmental, 2011) which recommends dust controls for coal mines. These best practice controls were considered

Issue	Response
	and the measures that are applicable to the Modification were adopted. The dust controls that have been adopted and the predicted reductions in emissions as a result, are outlined in Appendix C of the Air Quality study (in Appendix B of the EA).
Dust concentrations in the Hunter Valley are already greater than the air quality criteria.	<p>EJA refers to exceedances of the annual average PM₁₀ criterion at seven monitors in the UHAQMN: Warkworth, Mount Thorley, Camberwell, Singleton NW, Maison Dieu, Muswellbrook and Muswellbrook NW. EJA uses these exceedances to support the argument that no new dust sources are acceptable. This line of argument is misleading because these monitors are in locations that will not experience dust emissions due to the Modification. The only monitor in the UHAQMN that may encounter dust generated by Dartbrook Mine is the monitor at Aberdeen. The annual average PM₁₀ concentrations recorded at Aberdeen from 2012-2018 (as presented in EJA's submission) were less than the relevant criterion.</p> <p>EJA's submission also presented the maximum PM₁₀ concentrations recorded on a single day. This is another misleading statistic because the worst-case daily concentration is generally due to extreme events such as bushfires or dust storms, rather than mining activities.</p> <p>It should also be noted that elevated dust levels observed in recent years correlate with dry conditions in the region. The annual rainfall recorded at the Scone SCS station (operated by the Bureau of Meteorology) was 362.7 mm in 2018 and 360.3 mm in 2017. Rainfall for the previous two years has been significantly less than the long-term average of 636 mm. Dry conditions result in greater amounts of wind-blown dust, which applies to all land, not just open cut mines.</p>

3.5 ATTACHMENT E – PROPONENT

No response required.

3.6 ATTACHMENT F – HUNTER THOROUGHbred BREEDERS ASSOCIATION

Issue	Response
The Modification will disturb ECIC and Biophysical Strategic Agricultural Land (BSAL)	This was addressed in Section 4.6 of AQC's submission dated 23 April 2019 and is further addressed in Section 2
Social impact assessment is not adequate	This was addressed in Section 4.8 of AQC's submission dated 23 April 2019..
AQC does not have mining experience	<p>AQC has extensive mining experience at an operational and executive level;</p> <ul style="list-style-type: none"> AQC CEO Mr John Robinson has an accounting and commerce background. John Robinson has led numerous public and private equity acquisitions in the mining, property and retail sectors. He has been intimately involved in mergers and acquisitions and the undertaking of sophisticated financing arrangements pertaining to these asset classes. He also has extensive experience with the support services that the mining, oil and gas sectors require at their Australian operations. John is currently the Chairman and Managing Director of ASX-listed Australian Pacific Coal (ASX:AQC) based in Australia. Dartbrook was acquired by AQC from the London Stock Exchange-listed Anglo American Plc (LSE:AAL) in May 2017. AQC

Issue	Response
	<p>also owns Queensland coal exploration tenements, largely in the Bowen Basin, Queensland. The Bowen Basin is Queensland's largest coal basin with large coking and thermal coal reserves. John Robinson also has extensive interests in the Australian thoroughbred industry.</p> <ul style="list-style-type: none"> • AQC director Mr Bruce has a strong management and operational background and considerable experience in dealing with matters pertaining to the mining industry. Mr Munro can provide valuable insights in connection with the Company's current and future developments. Mr Munro is an Honours graduate from the University of New South Wales School of Civil Engineering. He has more than 40 years' experience as an engineer and manager with major construction and mining contractors in a number of countries including Australia, Asia, India and southern Africa. From 2011 until his retirement in 2015 Mr Munro was the Managing Director of Thiess Pty Ltd, which during this period had around 20,000 employees and annual revenues up to A\$7 billion. He has been involved as a contractor in the development and/or operation of numerous mines for clients such as BHP, Glencore, Rio Tinto, BP, Peabody, Bumi Resources, Inco, Wesfarmers, Vale and Fortescue. Whilst Bruce held the role of CEO, Thiess was mining in excess of 50 million tonnes per annum of coal. Mr Munro is a Fellow of the Institution of Engineers Australia and a previous non-executive Director of then ASX listed Sedgman Ltd. During his career, he served as a Director on a number of industry bodies, international business councils and diversity groups. Director since 19 May 2017. • AQC director Shane Stone has a strong commercial and legal background and considerable experience in dealing with Commonwealth and State governments. Mr Stone has at various times acted as an independent director to various public and private companies. Formerly Deputy Chairman UK listed Impellam plc, Chairman of ASX listed Regalpoint Resources Limited and Chairman of Mayfair Limited (Anne Street Partners and QNV Constructions). Former Chief Minister of the Northern Territory and Federal President of the Liberal Party of Australia. Formerly a barrister he is a graduate of Australian National University, Sturt, Adelaide and Melbourne Universities. He is a Fellow of the Australian Institute of Management, Australian College of Education and Australian Institute of Company Directors. He was made a Companion of the Order of Australia in 2006. He has also been conferred national awards from Indonesia and Malaysia. Director since 1 August 2016. <p>There are numerous recent examples of small or new management teams successfully managing and developing mining operations. Large mining businesses often have large overheads and internal competition for capital which may inhibit them from achieving an optimal return from the asset. It is untrue to imply that a small team with a single operational focus cannot deliver an improved operational outcome.</p>
The Modification is not economically justifiable	Refer to Section 2
Dust exceedances recorded by the UHAQMN	The monitors that have recorded exceedances of the annual average PM ₁₀ criterion are located in parts of the Hunter Valley that will not be affected by

Issue	Response
	the Modification. Measured annual average PM ₁₀ levels at Aberdeen are currently within the criterion and are predicted to remain within the criterion when emissions associated with the Modification are included
Air quality assessment has been limited to residences and does not consider impacts to areas of land	The VLAMP states that acquisition rights apply if the criteria are predicted to be exceeded over more than 25% of a property containing a dwelling (or where a dwelling can be built). Potential impacts to private land have been assessed in accordance with the VLAMP and acquisition obligations have been added to Condition 6.1(c) of DA 231-7-2000
The Hunter Tunnel should be used instead of the proposed truck haulage route due to air quality and visual considerations	This was addressed in Section 4.3 of AQC's submission dated 23 April 2019. AQC reserves the right to use the Hunter Tunnel under the current approved consent.
Blasting has not been assessed	No blasting will be required for the Modification
No assessment of cumulative noise impacts	Cumulative noise impacts were discussed in Section 4.3.3 of the RTS
No assessment of cultural heritage values	This was assessed in Section 4.7 of AQC's submission dated 23 April 2019
Previous PACs have concluded that mining is incompatible with other land uses.	This was assessed in Section 4.10 of AQC's submission dated 23 April 2019

3.7 ATTACHMENT G – MARSDEN JACOBS ASSOCIATES

Issue / Assertion	Response
Net social benefit at the national scale is negative and net social benefits at the NSW scale is only marginally positive when value of coal is lower and capital cost, operating costs and externality costs are higher	MJA has pointed out that if they increase all the cost categories and decrease all the benefits the project is not economically beneficial. However, the scenario is not based on alternative feasibility assessments by mining experts or alternative technical assessments of environmental impacts. If the capital costs, operating costs and revenues of the Modification and revenues were as asserted by MJA then the Modification would not be financially viable and AQC would not be seeking approval for it.
Capital costs should be significantly higher	The higher capital costs referred to by MJA are in relation to a Feasibility Scenario that assumed an expedited target production rate of 2.5 – 3 Mtpa, transfer of ROM coal to the CHPP via the Hunter Tunnel and the washing of coal and hence upgrades to the CHPP. The Modification is materially different to this Scenario, with an average annual production rate of 1.0 M tonnes, a requirement for less equipment due to the lower production rate. AQC is comfortable that the work undertaken to assess capital costs for the project is appropriate.
Operating costs should be higher a) Operating Costs would be 10% higher due to the increased FTE count required b) If a coal washery were required to ensure the coal product meets market requirements this would increase the mining costs.	The operating costs used in the economic analysis included all costs associated with mining, including labour costs. The Modification seeks to mine via an alternate method, in addition to that already approved. The coal washery element is not contemplated for this aspect of the Modification as it is already within the approval. AQC is comfortable that the work undertaken to assess capital costs for the project is appropriate. Further discussion on washery capital and operating costs is contained elsewhere in this submission.
The assumed coal price of USD\$73 per tonne is at risk, due to the coal having a high ash content	The Modification will target the highest quality coal plies within the Kayuga Seam. The in-situ ash content for these plies varies from 9-24%. Based on the in situ coal quality of these plies, the Modification will be able to produce a coal product ranging from 15-24% ash and averaging 5,500 kcal/kg energy content. The CBA assumed an achieved coal price of USD73/tonne. This is a conservative assumption, as the coal product will generally meet the requirements for a Newcastle

Issue / Assertion	Response
	<p>5,500 NAR Export Thermal Product, which has at various points in the past two years been trading around or in excess of this level.</p> <p>It should also be noted that the CBA assumed an AUD:USD exchange rate of 0.77. The current exchange rate is around 0.69 (www.rba.gov.au). If this AUD weakness persists or continues, this will considerably increase the revenue from the Project and the net production benefits that accrue to NSW.</p>
<p>Royalty payments are overstated, with two key issues (i) assumed coal price and (ii) NSW share of project ownership both affecting this calculation</p>	<p>NSW share of project ownership is irrelevant to the estimation of royalty payments. All royalties accrue to the NSW Government regardless of project ownership. As identified above, the assumed coal price is reasonable and when combined with a revised exchange rate, revenues and hence royalties may actually be understated.</p>
<p>Company tax from the Modification is overstated because economic analysis assumes a 30% tax rate whereas recent analysis has shown that mining companies pay significantly less tax (2.7% to 6.8%) because they actively minimise this cost</p>	<p>The Company tax rate in Australia is 30% of taxable income. Studies that claim that mining companies pay significantly less rates of company tax, either deliberately or mistakenly calculate the tax rate as a percentage of revenue or gross operating surplus, metrics that have no place in a tax calculation. An analysis of Australian Tax Office data by Dr Sinclair Davidson², Professor of Institutional Economics at RMIT University found that the Australian mining industry pays corporate tax at a rate close to 30% of its taxable income.</p>
<p>Producer surplus are overstated, because (i) increased capital and operating costs, and reduced revenue all reduce the producer surplus, and (ii) the analysis attributes 32% of the net producer surplus without justifying the NSW share of project ownership*.</p>	<p>The assumed capital and operating costs for the Modification are appropriate - see above.</p> <p>The CBA attributes 32% of the Australian net producer surplus i.e. net production benefits minus company tax minus royalties, to NSW based on NSW's share of the Australian population. This is the default approach identified in the NSW Guidelines (2015, p. 12), for allocating net producer surplus to NSW.</p>
<p>Externality impacts are either ignored or under-estimated</p>	<p>This point is incorrect. Economic consideration of externalities first relies on technical specialists to identify the potential physical impacts of proposals. Only once physical impacts are identified can economists attempt to place a value on them. Biophysical assessments of the Modification identified insignificant residual biophysical impacts after mitigation, compensation and offset and hence there are minimal material economic impacts for inclusion in the CBA.</p> <p>It should be noted that NSW has a highly developed regulatory system in relation to mining projects, that has evolved over many years and essentially makes proponents internalise potential externality costs into their capital and operating costs e.g. via project design, mitigation measures, offsets, compensation payments etc.</p>
<p>MJA assumes externalities at 5% of Net Production Benefits</p>	<p>There is no basis for this assumption</p>
<p>MJA includes in its calculation, the global social damage costs of Scope 1 and Scope emissions from the Modification</p>	<p>NSW Government endorsement of the Paris Agreement is irrelevant to how CBA of projects is undertaken.</p> <p>The NSW Government (2015) Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals clearly identify that the relevant community for assessing the public interest of a proposal using CBA is the collective public interest of households in NSW. NSW Treasury (2017) NSW Government Guide to Cost-Benefit Analysis also makes it clear a CBA should focus on impacts (costs and benefits) to the NSW community.</p>

² Davidson, S. (2014) Mining Taxes and Subsidies: Official evidence, A Minerals Council of Australia Background Paper.

Issue / Assertion	Response
	<p>Hence, only the impacts of Scope 1 and 2 GHG emissions, from the identified Modification (coal mining and delivery to Port), on the households in NSW should be included in a CBA of a mining project in NSW. Consistent with the Technical Notes (NSW Government 2018), global social damage cost estimates of Scope 1 and 2 GHG emissions of the Modification therefore need to be apportioned to NSW only. The approach taken by Gillespie Economics in the Modification CBA has previously been endorsed by the Department of Planning and Environment (2017) Residual Matters Report: State Significant Development, Wallarah 2 Coal Project (SSD 4974).</p>
<p>Economic benefit to suppliers is based on generalised assumptions and might not accrue to the state, particular if the business chooses to source non-labour inputs from interstate or overseas.</p>	<p>The Gillespie Economics assessment of potential economic benefits to suppliers was based on location quotient analysis which indicates the concentration of employment in different sectors in the NSW economy relative to the Australian economy and hence the ability of the NSW economy to supply the inputs to production required by the Modification.</p> <p>This analysis indicated that approximately 66% of non-labour coal mining expenditure is likely to be sourced from the NSW economy. This is not considered unreasonable given that the NSW economy already has large specialised sectors servicing the already large mining sector in NSW.</p> <p>If AQC source a greater percentage of non-labour inputs from NSW then the estimated economic benefits to suppliers will be larger than estimated. Sourcing non-labour inputs from interstate when they could be sourced closer and avoid additional transport costs makes little sense.</p>

4. CONCLUSION

The information presented in this submission is in direct response to further queries from the IPC to DPE dated 9 May 2019.

Together with, the information contained within this letter report, AQC and its consultants are firmly of the view that the IPC has before them sufficient, robust technical and other information to determine the Modification application, consistent with DPE's recommendation to the IPC in January 2019.

Yours sincerely,



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For correspondence and other enquiries:
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