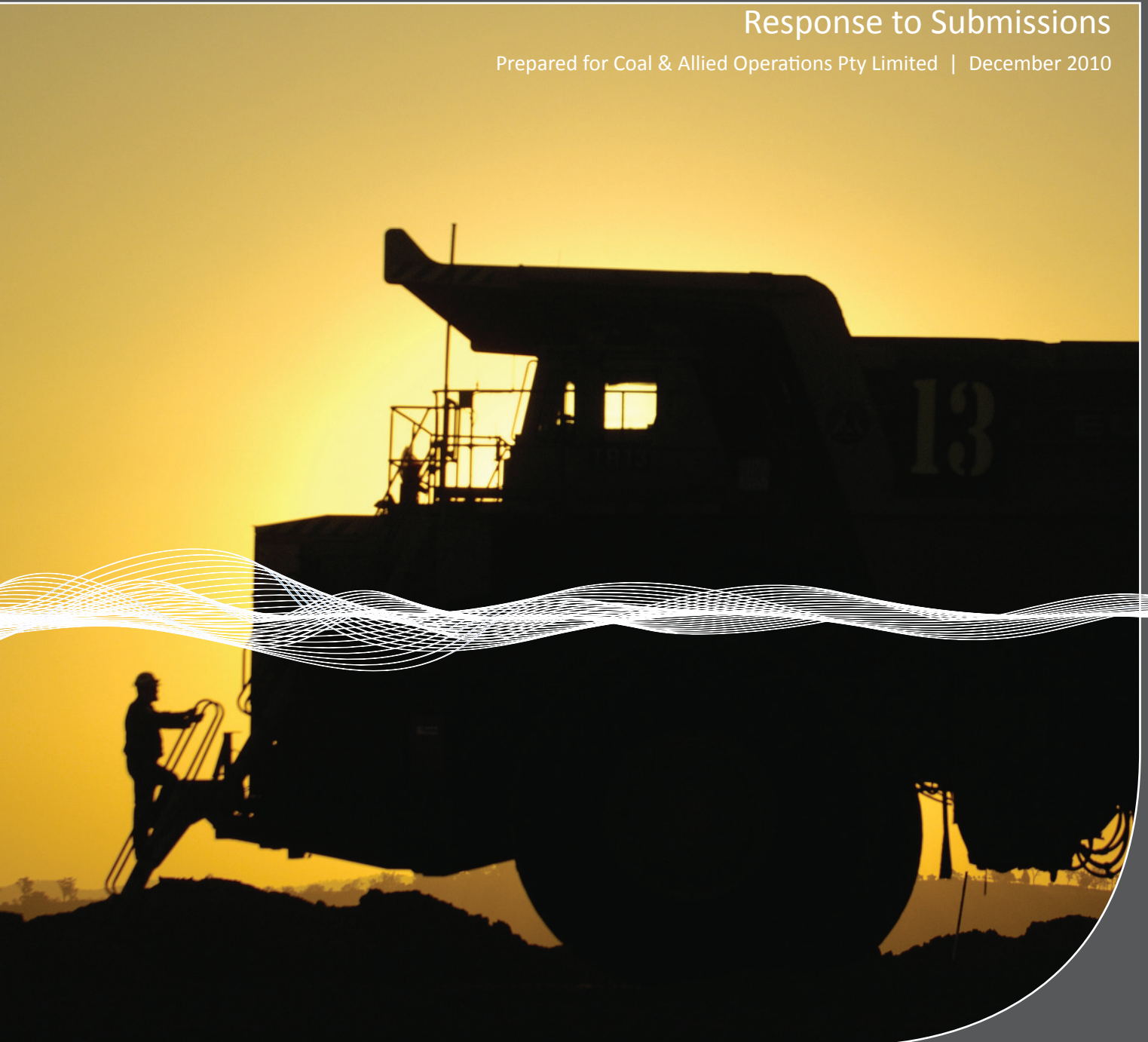


# CARRINGTON WEST WING

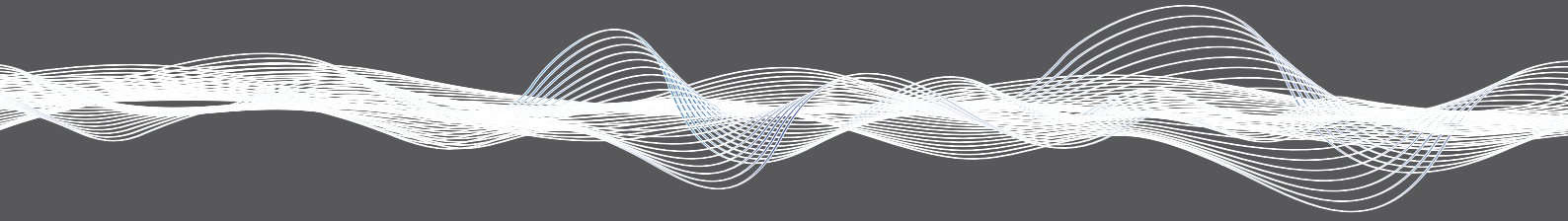
## Response to Submissions

Prepared for Coal & Allied Operations Pty Limited | December 2010



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## Carrington West Wing

Response to submissions

Final

Coal & Allied Operations Pty Limited | December 2010

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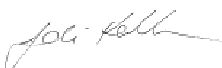
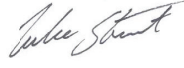
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## Carrington West Wing

Response to submissions

Coal & Allied Operations Pty Limited | December 2010

Prepared by	<b>Jodi Kelehear</b>	Approved by	<b>Luke Stewart</b>
Position	Senior Environmental Scientist	Position	Director
Signature		Signature	
Date	21 December 2010	Date	21 December 2010

This Report has been prepared in accordance with the brief provided by the Client and has relied upon the information collected at or under the times and conditions specified in the Report. All findings, conclusions or recommendations contained within the Report are based only on the aforementioned circumstances. Furthermore, the Report is for the use of the Client only and no responsibility will be taken for its use by other parties.

### Document Control

Version	Date	Prepared by	Reviewed by
1	10 December 2010	Jodi Kelehear Peter Stewart	Luke Stewart
2	14 December 2010	Jodi Kelehear	Luke Stewart
3	21 December 2010	Jodi Kelehear	Luke Stewart

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# 1 Introduction

## 1.1 Background

Coal & Allied Operations Pty Limited (the Proponent) owns and operates the Hunter Valley Operations (HVO) North mining complex, inclusive of the Carrington Pit, located approximately 24 kilometres (km) north-west of Singleton in the Hunter Valley region of New South Wales (NSW).

The mine currently operates under Development Consent No. DA 450-10-2003, which was issued by the then Minister for Infrastructure and Planning in 2003, under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Proponent is proposing to modify the Development Consent under section 75W of the EP&A Act, to allow for the extension of the existing approved Carrington Pit by approximately 137 hectares (ha) to the south-west, and extract approximately 17 million tonnes (Mt) of in-situ coal. The proposed modification is referred to as the 'Carrington West Wing proposal' or 'the proposal'.

A request to modify a major project form was lodged with the NSW Minister for Planning on 8 April 2010. An Environmental Assessment (EA) of the proposal was prepared by EMGA Mitchell McLennan Pty Limited (EMM), in accordance with the Director-General's Environmental Assessment Requirements (EARs) issued by the NSW Department of Planning (DoP). It was prepared with input from water, noise, air, soils, ecology and heritage specialists.

The EA was lodged with the DoP for adequacy review on 25 August 2010. Following feedback from the adequacy review, the document was modified and subsequently, on 1 October 2010, it was deemed adequate by the DoP to proceed to public exhibition. The EA was placed on public exhibition from 8 October to 5 November 2010, during which time public comment could be submitted to the DoP. Hard copies of the EA were made available at the offices of the DoP, Singleton Council and Nature Conservation Council and at the Proponent's Singleton shopfront, as well as electronic copies on the Proponent's website. Hard copies were also sent to government agencies nominated by the DoP.

This report provides a response to submissions.

## 1.2 The Proposal

The proposal is to extend the existing approved Carrington Pit by approximately 137ha to the south-west, into land which is predominantly cleared of native vegetation and on lands owned by the proponent. The proposal would allow for the extraction of approximately 17Mt of in-situ coal from the Broonie, Bayswater and Vaux seams.

Overburden would be emplaced in-pit, as well as at two out-of-pit overburden emplacement areas to be established on previously disturbed and rehabilitated land immediately north of the proposed extension area. The final landform goal for in-pit disposal of overburden would be to return the mined out areas of the proposed extension area as close as possible to the pre-mining landform.

The proposal also includes the following supplementary activities.

- The approved footprint of the Carrington evaporative sink would be extended for the long term management of groundwater post-mining.

- The impermeable groundwater barrier wall previously assessed for the western paleochannel would be realigned further south, to prevent groundwater migration from the Hunter River into the mine, and migration of water from the mine into the Hunter River alluvium.
- A two stage, temporary levee and diversion system would be established to ensure that the proposed extension area is protected from flooding and to enable the diversion of an unnamed tributary of the Hunter River (referred to herein as the 'Unnamed Tributary') that presently runs in a southerly direction across the footprint of the proposed extension area.
- A service corridor would be constructed along the southern boundary of the proposed extension area. This may incorporate water pipelines, an all weather access road and other ancillary services.

The proposed extension would have a life of approximately six years and is expected to be completed within the existing Development Consent period, which is currently approved to 2025.

### 1.3 Purpose of this report

This response to submissions report has been prepared in accordance with section 75H(6) of the EP&A Act. It will be submitted to the DoP, which is the consent authority, for consideration in its assessment and determination of the proposed modification.

## 2 Summary of submissions and responses

### 2.1 Submissions received

Following public exhibition of the EA, a total of 74 submissions were received. These submissions are categorised as follows:

- 61 from members of the community;
- 10 from non-government organisations (NGOs), comprising; Nature Conservation Council of NSW, Australian Water Campaigners Incorporated, North East Forest Alliance, Jerrys Plains & District Progress Association, Hunter Environment Lobby, Rivers SOS, Hunter Valley Water Users Association, Singleton Shire Healthy Environment Group, NSW Farmers Association, and Construction, Forestry, Energy and Mining Union; and
- three from government agencies, comprising the Department of Environment, Climate Change and Water (DECCW), Singleton Council and NSW Industry & Investment (I&I NSW).

### 2.2 Matters raised and response methodology

All submissions received were reviewed and the matters raised summarised into the tables presented in Appendices A, B and C for community, NGO and government submissions, respectively. Also, the DoP has implemented a system whereby submissions are now posted online at <http://major.projects.planning.nsw.gov.au/> within 10 business days following completion of exhibition. Each individual matter raised in a submission was assigned a category, such as 'water' or 'air quality', as well as an identification code representing the respondent and matter number, e.g. C6.1 refers to the first issue raised in community submission number six. Responses were then prepared and are provided in the following chapters.

It is noted that in instances where an aspect was raised within several submissions, such as air or noise, responses have been grouped by attribute, and are presented in Chapters 3 to 12. Chapter 13 'Other Matters' provides for miscellaneous matters raised across a small number of submissions.

For ease of reference, the relevant identification codes to which each response applies are included in the following chapters. Further, the tables in Appendices A, B and C include a column which cross-references where each matter has been addressed in the body of the report.

It is noted that the I&I NSW submission was not received until 13 December 2010, some time after closure of the exhibition period. Accordingly, this submission is addressed separately in Appendix D.

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## 3 Groundwater

### 3.1 Assessment approach

**Submissions** – C27.10, C42.1, C42.2, C42.3, C43.5, C43.6, C48.1, C48.6, C57.5, C62.10, C62.11, C62.22, N1.1, N1.2, N1.3, N1.18, N1.21, N2.5, N5.9, N6.16, N6.18, N6.19, N6.23, N6.24, N6.25, N6.34, N6.37, N9.1, N9.2, N9.5, N9.7

Several submissions raised comments in relation to the approach to the groundwater assessment and the rigour of the results reported in the EA. A summary of these comments is presented in italics following, with a response provided beneath each comment.

*Inadequacy of groundwater modelling and assessment, and requirement for the assessment to be undertaken by an independent expert.*

The groundwater assessment in the EA was undertaken by Dr Colin Mackie of Mackie Environmental Research (MER) who is regarded as an expert in relation to groundwater and mining. The assessments are based on a long standing history of conservative impact assessment for the HVO and for the Carrington Pit. The assessment was supported by a groundwater model that is regarded as the most rigorously calibrated in the Hunter Valley region. The model has been developed over many years and has successfully predicted impacts of mining since the commencement of the first slot at Carrington in 2000. Further, monitoring undertaken across the Carrington area has verified modelling predictions from previous impact assessments, providing confidence in the predictions presented in the EA.

*Insufficient number of piezometers given the complexity of the paleochannel system and the adequacy of data used in the groundwater modelling.*

As reported in Section 5.2.1 of the EA, the paleochannel geometry has been progressively defined from exploration drilling and numerous piezometer drilling programs during the period of mining at Carrington Pit. Additional groundwater investigations were undertaken for the current proposal, including the installation of 12 piezometers, to enable the depth and extent of the paleochannel in the proposed extension area to be characterised. The current and historical groundwater monitoring network at HVO North, including the additional 12 piezometers, is shown on Figure B1 of the groundwater study (EA Appendix C). This information was incorporated into the modelling. The model was carefully calibrated, using an extensive database from more piezometers than any other mining project that MER is aware of in the Upper Hunter.

*Geology of the Hunter Valley is complex and unpredictable and the assumptions made have too great a margin of error. The full extent of faults and fractures which transmit groundwater and their effects on the mine and water behaviour have not been adequately described.*

As discussed above, the hydrogeology across the Carrington area is well understood. A large volume of data was utilised in the assessment of potential impacts. The data, including any assumptions, are documented in the appendices to the groundwater study (EA Appendix C). Again, monitoring undertaken across the Carrington area has verified modelling predictions from previous impact assessments, providing confidence in the predictions presented in the EA.

*Loss of base flow to the Hunter River has been underestimated when considering the cumulative impacts of current disturbance. Specifically past, current and proposed impacts on the groundwater and surface water systems associated with the Hunter River have not been adequately identified.*

Modelled results presented in Section 5.2.2 of the EA and within the groundwater study (EA Appendix C) incorporate regional and local cumulative impacts. Table 5.2 in the EA provides a comparison of predicted impacts from the proposed mine plan against those associated with the approved mine plan, or current impacts. Notably, the table illustrates that with a barrier wall, there is predicted to be no increase in the seepage rate from the Hunter River/alluvium compared to the existing Carrington Pit.

*The EA has not quantified existing pit seepage or reported pump out rates and volumes.*

Seepage into the existing Carrington Pit occurs from a variety of sources and directions. The existing pit seepage rate is too low to measure by conventional weir or flow meter. Section D4 of the groundwater study notes that the model predicts a rate of approximately 0.1 mega litres (ML)/day from all sources. Water reporting to the Carrington Pit is received from multiple sources. Pump out rates and volumes do not provide an accurate assessment of pit seepage as rainfall, surface runoff, evaporation and other parameters influence the amount of water in the pit at any one time. Anecdotally, the existing pit seepage is consistent with (or lower than) the predicted seepage rate. Hence the volumetric prediction for modelling (calibration) purposes is considered to be acceptable.

*High rainfall events could increase seepage and cannot be used as a mitigating influence; loss of base flows will still occur regardless of weather conditions.*

Baseflow losses via the paleochannel alluvium will be largely mitigated following installation of a barrier wall. Subsequent periods of higher rainfall (rather than specific events) will raise groundwater levels to elevations above the river level in the alluvium south of the proposed barrier and leakage will be further mitigated as a result.

The deeper hardrock coal measures are predicted to respond much more slowly due to the low vertical permeabilities of the strata. This leakage circuit (about 0.048ML/day) will not be mitigated to the same extent but this leakage is considered to be relatively small and will reduce in time as post mining recovery of water levels in spoils emplaced on the north side of the wall, occurs.

*The seepage predictions do not take into account that over more than 50 years, loss of base flows to the river could be more than 900ML.*

Seepage-leakage predictions are calculated on a daily rate. Loss of baseflows could be calculated over 50 years and would indeed be of the order 900ML. Placing this in context, the 90 percentile high river flow (flows likely to be exceeded 90 per cent of the time) over the same period would be of the order of 1638 giga litres.

*Believe there is a serious discrepancy between predicted seepage into the pits and current pump-out. The predicted 0.48ML/day must be verified.*

A rate of 0.48ML/day is not indicated in the groundwater studies. The predicted seepage into the pits cannot be verified until the pits are constructed. Measurement of inflows (if of measurable magnitude) will be invoked as part of the monitoring program using catch drains and V-notch weir apparatus.



*Lack of acknowledgement of connectivity between the paleochannel and the Hunter River. The paleochannel alluvium provides good quality base flows direct to the river system.*

The nature of the paleochannel and its connectivity with the Hunter River are discussed in Section 5.2.1 of the EA.

*The EA has not adequately assessed long term unmitigated impacts for groundwater.*

Groundwater management measures, including the relocation of the groundwater barrier wall to the south of the proposed extension area, the extension of the existing evaporative sink and the offsetting of any potential water take, form fundamental elements of the proposal. Accordingly, the results presented in the EA are based on the premise that these management measures are in place.

### 3.2 Impact on the alluvial aquifer

**Submissions** - C5.4, C6.3, C6.5, C8.1, C8.2, C9.4, C9.5, C10.1, C10.3, C10.8, C11.3, C11.5, C12.3, C12.5, C13.2, C14.1, C14.5, C15.2, C15.3, C15.7, C16.2, C16.3, C17.5, C18.3, C18.5, C19.2, C19.3, C20.3, C20.5, C21.1, C22.3, C22.5, C23.2, C25.3, C25.5, C26.4, C27.10, C28.2, C29.3, C29.4, C30.1, C30.4, C31.3, C32.6, C32.8, C33.4, C33.6, C34.3, C35.7, C36.3, C36.5, C37.3, C38.3, C38.5, C39.2, C42.15, C43.1, C44.5, C45.11, C47.6, C47.8, C48.1, C48.3, C48.14, C51.3, C51.5, C52.1, C54.5, C54.7, C56.1, C59.5, C60.19, C61.1, C62.16, C62.23, N1.1, N1.17, N1.22, N2.6, N2.7, N3.2, N4.6, N4.8, N5.13, N6.1, N6.4, N6.12, N6.15, N6.36, N6.41, N7.5, N7.6, N9.6, N.15, G2.15

Removal of the alluvial aquifer and resultant impacts to the agricultural land and the Hunter River were raised in several submissions. The potential long term impacts to the alluvial aquifer system were also raised. Several submissions also commented on the potential for the proposal to set a precedent for mining within the Hunter River alluvium.

Responses to the comments relating to impacts on agricultural land and the Hunter River are provided in Chapter 5 and Sections 3.4 and 4.2.

The paleochannel aquifer is an isolated meander that has, in recent geologic time, only contributed a small amount of groundwater flow to the Hunter River. That flow has been saline and there are no beneficial uses of water within its catchment of origin. In regards to longterm impacts on the alluvial aquifer, as reported in Section 2.3 of the EA, there will be no long term drawdown of alluvial groundwater that will degrade the groundwater quality to the south of the barrier wall. North of the barrier wall, as discussed in Section 3.1 above, the long term seepage rate is predicted to be similar those currently approved, with the saline water flowing from the paleochannel toward the Hunter River being captured within the mine. Prior to mining at Carrington, the groundwater quality within the paleochannel was naturally saline, with an electrical conductivity (EC) typically greater than 8,500 micro Siemens per centimetre ( $\mu\text{S}/\text{cm}$ ) seeping to the Hunter River. This poor water quality is unlikely to be restored in the long term. Instead, an improved water quality is likely to prevail within the Hunter River alluvium to the south of the barrier wall.

The EP&A Act requires consent and determining authorities to consider proposals on their merits and sets out specific criteria by which proposals have to be assessed. The notion of 'setting precedents' is not embraced in the EP&A Act. Given that scientific standards and community and government attitudes can, and often do, change over time, it is considered reasonable and proper that the EP&A Act does not use the concept of precedents as a guide to the acceptability of proposals. It is expected that any future mining proposals which might involve Hunter River alluvium would be treated on their merits and in accordance with the environmental and planning legislation in existence at the time.

### 3.3 Contamination

**Submissions** - C5.2, C5.4, C10.1, C17.5, C21.1, C21.2, C28.2, C32.2, C33.4, C41.6, C42.11, C44.7, C45.13, C45.14, C49.1, C49.9, C52.1, C59.5, C62.12, N4.6, N6.12, N6.32, N7.5, N9.6

Several submissions raised the potential for the proposal to contaminate underground aquifers and the Hunter River. Water table salinity was also raised.

The impact from any potential contamination of underground aquifers is addressed in the EA Section 5.2 and Appendix C. The re-saturation of spoils will initiate mineral dissolution, as described in the EA. This will generate a particular ionic species distribution which will change over time as the evaporative effects of the open water void and the dilutive effects of rainfall and runoff, take hold. The installation of the barrier wall to the south of the proposed extension area and the exiting barrier wall at Carrington will serve to isolate the re-saturating spoils from the Hunter River alluvium.

### 3.4 Reduction in Hunter River base flows

**Submissions** – C5.4, C6.3, C9.4, C10.1, C10.3, C11.3, C12.3, C13.2, C14.1, C15.4, C16.3, C17.5, C18.3, C19.2, C20.3, C22.3, C25.3, C28.2, C29.3, C29.5, C30.1, C30.2, C31.3, C32.6, C32.8, C33.4, C34.1, C34.4, C35.7, C36.3, C37.3, C38.3, C42.11, C42.24, C43.9, C44.5, C44.7, C45.11, C45.13, C45.15, C46.2, C46.3, C47.1, C47.6, C48.1, C48.5, C48.6, C48.14, C49.6, C51.3, C52.1, C54.5, C56.3, C56.6, C58.14, C62.9, C62.23, N1.1, N1.3, N1.7, N1.18, N1.21, N2.2, N3.3, N4.6, N5.13, N6.4, N6.15, N6.44, N9.6

Reduction of Hunter River base flows resulting from the extension of mining within the alluvium was raised in several submissions. Generally comments related to loss of water from the removal of the aquifer itself, from depressurisation, and associated impacts on water supply, security and the natural environment.

Section 5.2.2ii of the EA addresses the potential impacts to Hunter River base flows resulting from the proposal. Modelled results presented in Section 5.2.2 of the EA and within the groundwater study (EA Appendix C) incorporate regional and local cumulative impacts. Section 5.2.1 of the EA provides an overview of the existing environment including hydraulic gradients within the alluvium.

In summation, the EA demonstrates that the proposal would not result in an increase in the currently authorised 'water take' from the paleochannel nor the Hunter River associated with the Carrington Pit. The water that would normally flow from the paleochannel to the Hunter River no longer flows in this direction. This is due to a reversal in gradient from the existing, approved Carrington Pit (consistent with the previous assessments that were subsequently approved). The barrier wall proposed to the west of the existing pit would be relocated further to the south to create a barrier between the proposed extension area and water contained within the alluvium. The small loss of water from the Hunter River from depressurisation of the coal seam(s) is predicted to be similar to the existing rate (refer to Section 3.1). It would be balanced by recovery of water levels in the alluvium (south of the barrier wall).

The resultant impact on minimum baseflows in the Hunter River would be very minor or negligible. This impact was calculated (and reported in Section 5.2.2 of the EA) to be about 0.05ML/day or 0.3 per cent of the 1 per cent minimum flow (i.e. the flow rate that is exceeded 99 per cent of the time) and is the same as for the existing, approved Carrington Pit. This diversion/loss could be accounted for through current high security water supply licences held by the Proponent for water take from the Hunter River, similar to existing arrangements. Accordingly, there would be no net loss and no effect on water security.

Prior to mining at Carrington, the groundwater quality within the paleochannel was naturally saline, with an EC typically greater than 8,500µS/cm seeping to the Hunter River. Due to the elevated salinity levels, it

is considered to have little beneficial use. This poor water quality is unlikely to be restored in the long term. Instead, an improved water quality is likely to prevail within the Hunter River alluvium to the south of the barrier wall.

### 3.5 Barrier wall

**Submissions** - C42.24, C42.25, C42.26, C42.27, C42.29, G2.3, C43.6, C45.11, C49.8, C49.9, C58.12, C45.10, C45.16, C45.17, C49.7, C60.12, N1.5, N1.6, N6.14, N6.17, N6.19, N6.21, N6.22, N6.23, N6.25, N6.27, N7.9, N9.8

Several submissions raised comments in relation to the groundwater barrier wall. A summary of these is presented in italics following, with a response provided beneath each comment.

*Further details of the barrier wall, including method of construction, composition and permeability, longevity and long term effectiveness were raised in several submissions.*

Bentonite barrier walls are engineered structures designed for prevention of fluids transferring from either side of the wall. Similar barrier walls have been commonly used throughout the world to prevent fluids leaking from one environment to another. Examples of the use of similar barrier walls include the former Newcastle steel works to protect the Hunter River and one utilised by the Proponent at the Alluvial Lands project at HVO North (refer also to response below).

Indicatively, the construction of the barrier wall would include the following.

- Further assessment of site conditions and geotechnical investigation will be undertaken by a suitably qualified engineer to assess bed rock conditions as well as overlying strata conditions. The design of the barrier wall will include parameters adapted from the geotechnical investigation and the performance criteria required to provide a long term stable barrier wall which protects seepage to and from the Hunter River.
- A staged excavation will be undertaken of the barrier wall location.
- Backfill material utilising the excavated spoils which will be homogenised and blended with bentonite slurry and possibly additional dry bentonite powder (if conditions necessitate) to form a well mixed material with the consistency of wet concrete. The amounts of these components are adaptable to meet the design. This slurry will then be pumped into the staged excavation. Quality control will be undertaken by the construction engineer.

The highly impermeable wall would have a design permeability of approximately  $1 \times 10^{-4}$  metres (m)/day. Final design, including the approach to construction, would be provided to the relevant regulatory authorities for approval prior to construction.

Seepage would be monitored through nested piezometers and visual inspections.

*Monitoring of results to ensure the efficacy of the barrier wall and the reporting of results were raised in several submissions. It was noted that peizometer results from the existing barrier wall are not included in the Annual Environmental Management Report (AEMR). One submission also noted that it would be appropriate for the DoP to employ an independent expert to oversee the efficacy of the barrier wall.*

The performance of the existing barrier wall that has been successfully utilised at the Alluvial Lands project was monitored during the mining phase by the use of nested piezometers and by visual inspections. The integrity of the barrier wall was also verified by inspections from various government

departments including I&I NSW and the NSW Office of Water (NOW). No significant seepage was detected during mining. The wall continues to be monitored by nested piezometers and data demonstrates that the wall still performs as designed.

Monitoring results for the proposed barrier wall will be reported in the AEMR. As has occurred with the existing barrier walls at both Carrington and the Alluvial Lands, the performance of the proposed barrier wall will also be monitored and inspected by various government departments including I&I NSW, NOW and the DoP.

Quality controls will be implemented during all phases of construction by suitably qualified engineers to ensure that the barrier wall is constructed as per design.

*Several submissions commented on the projected performance of the barrier wall, particularly given depressurisation and blasting and the potential for water from the Hunter River to be admitted under and around it.*

Design specifications include consideration of factors such as blasting and depressurisation. Experience with the Alluvial Lands project has demonstrated that blasting has not increased seepage through fracturing of the hard rock below the barrier wall.

Figure 5.1 within the EA depicts the perimeter of the paleochannel. The barrier wall will extend across the entirety of the paleochannel and be keyed into the hardrock beneath, isolating the potential impacts of mining from the Hunter River and its associated alluvium. As discussed in Section 5.2.2ii of the EA, loss of Hunter River baseflows would result from sustained leakage via the coal measures, where deeper depressurisation induces downwards flow from the alluvium. However, as detailed in Section 3.4 of this report, the proposal will not result in an increase to the reduction of Hunter River base flows.

*Further details on performance criteria, trigger mechanisms and remediation measures were also raised.*

Performance criteria, trigger mechanisms and remediation measures if required will be incorporated into the relevant management plans which will be updated to reflect the proposal. Refer also to Section 3.7 below.

### 3.6 Compliance with relevant legislation and guidelines

**Submissions** - *C6.1, C7.1, C8.1, C9.2, C10.4, C11.1, C12.1, C13.1, C14.4, C15.1, C16.4, C18.1, C19.1, C20.1, C22.1, C25.1, C26.2, C29.1, C32.3, C33.1, C35.6, C36.1, C37.1, C38.1, C41.5, C42.5, C43.8, C43.10, C43.12, C43.4, C44.6, C45.6, C45.11, C47.4, C51.1, C52.1, C54.1, C54.3, C60.14, C62.4, N1.4, N1.16, N2.1, N3.4, N5.10, N5.11, N5.12, N6.4, N6.6, N6.14, N6.31, N6.35, N7.12, N9.9, N9.21, G2.1*

Compliance with relevant groundwater related legislation and guidelines were raised in the above submissions. A summary of these is presented in italics following, with a response provided beneath each comment.

*Several submissions commented on the proposal's compliance with Water Sharing Plans (WSPs) for the Hunter River and Hunter Unregulated streams and alluviums. Compliance with the draft guidelines 'Management of Stream/ Aquifer Systems in Coal Mining Developments 2005' was also raised.*

Two WSPs pertain to the proposal, the WSP for the *Hunter River Regulated Water Sources 2004*, and the WSP for the *Hunter River Unregulated and Alluvial Water Sources 2009*. Section 2.3 of the EA demonstrates the proposal's compliance with the applicable WSPs.

The proposal does require excavation of alluvial materials identified within the Hunter River unregulated WSP. As discussed in Section 3.1, the water held in this aquifer is naturally saline with no beneficial use. The excavation of these materials will require regulatory approval.

The EA shows that there will be no increase in the take of water from the paleochannel or from the Hunter River compared to that currently approved.

The Proponent is committed to offsetting any predicted 'water take' associated with the proposal.

The Proponent holds water licences under the *Hunter River Regulated Water Sources 2004 WSP*. These licences are considered adequate to offset the taking of water associated with the existing Carrington Pit.

Section 5.2.2 of the EA provides consideration to the NOW (2005) guideline, *Management of Stream/Aquifer Systems in Coal Mining Developments – Hunter Region*. A detailed assessment of the predicted potential impacts on stream flow, stability and water quality has been undertaken and the results are presented in Sections 5.2 and 5.3 of the EA and in groundwater and surface water specialist reports contained in Appendices C and D of the EA.

The studies predict that there will be no impact on any licensed water users, basic landholder rights (other than the Proponent), or on any identified groundwater dependent ecosystems as a result of the proposal. There will be a very minor to negligible impact on minimum baseflows in the Hunter River (refer to Section 3.4) however this will be at a similar rate to that already approved. This diversion-loss could be accounted for through current high security water supply licences held by the Proponent for pumping from the Hunter River as is presently the case.

*Proposed extraction of water from the river will not be able to be metered and therefore compliance with the terms of the WSPs and the Water Management Act 2000 cannot be evaluated.*

Leakage via the coal measures and through the barrier wall would indeed be difficult to measure if it is small. Under such circumstances it is necessary to rely on groundwater hydraulic gradients determined from piezometers, and permeability measurements determined from rock core or hydraulic testing. These measurements are then employed in Darcys equation or in the groundwater model to estimate the flow rate. Permeabilities utilised in the modelling are conservative.

*Question how seepage offsets will be undertaken. If licenses are purchased, it is unclear what will happen after close of mining. No explanation is given of the process by which licences could be relinquished (if required).*

Seepage from the Hunter River is modelled on a conservative basis and is offset using the conservative estimate. If required upon mine closure the water take from the Hunter River will be surrendered from the existing High Security Water licences at HVO.

*The proposal should be independently assessed for Aquifer Interference Approval by the Office of Water under clause 91(c) of the WM Act 2000. Part 3A is inadequate to allow this.*

Section 5.2 of the EA and the groundwater study (Appendix C of the EA) are considered adequate for NOW to assess the requirement of an 'aquifer interference approval'. Compliance with the principles that would apply, including adequate arrangements being in force to ensure that no more than minimal harm will be done to the aquifer, or its dependent ecosystems, is demonstrated within Sections 2.3 and 5.2 of the EA.

### 3.7 Proposed mitigation and monitoring

**Submissions** – *N5.2, N6.5, N6.26, N6.27, N6.33, N9.2, G2.3, G2.4, G2.15*

Several submissions commented that the potential impacts will need to be carefully managed and monitored to ensure no impact. Several submissions also questioned the adequacy of the proposed monitoring program. It was also noted that there no triggers in place for management and remediation if serious damage is unexpectedly encountered and the amount of seepage/drawdown increases beyond that predicted.

Water management and monitoring at HVO North, inclusive of the proposal, will continue to be undertaken in accordance with the health, safety, environment and quality (HSEQ) Management System procedures and the HVO Water Management Plan. This includes a rigorous monitoring program, the results of which will be reported in the AEMR. The groundwater monitoring network is illustrated in Figure B1 of groundwater study (EA Appendix C).

The monitoring program will continue to be adaptive in a manner similar to past monitoring at Carrington. That is, the network will be extended where deemed appropriate and based on current monitoring and continual review of water table and pore pressure trends. Areas where unusual conditions are inferred will be subjected to detailed analysis, geological review and installation of piezometers prior to mining.

Drawdown impacts in the paleochannel alluvium will occur on the north side of the proposed barrier wall prior to removal of the alluvium. Drawdown impacts have been identified in areas on the south side of the proposed wall location but recovery will occur in these areas when a barrier wall is installed. This wall will be designed to effectively isolate the operations from the river and alluvial lands to the south.

Serious damage to alluvium on the south side of the wall is most unlikely. Possible mechanisms for damage relate to structural integrity and leakage from the contained pit shell, to the river.

Groundwater quality degradation will only occur if southward leakage develops. However, such leakage is improbable providing the evaporative sink remains functional (and there is no reason to believe otherwise) and maintains a surface water level below the river level. Even if the void water level is above the river level, leakage through the barrier wall and coal measures will be very small and unlikely to measurably impair river-alluvium water quality due to dilution effects.

The barrier wall has been nominated as a mitigation measure specifically for the purpose of prevention of fluids transferring from either side of the wall, providing consideration to the environment in which it will be constructed. It will be appropriately designed to allow for flexibility of ground movements, creating long term stability.

Performance criteria, trigger mechanisms and remediation measures if required will be incorporated into the HVO Water Management Plan which will be updated to reflect the proposal.

### 3.8 Other matters related to groundwater

**Submissions** - *C10.1, C17.5, C24.4, C27.9, C31.4, C42.6, C42.16, C43.7, C46.8, C49.1, C62.8, N1.20, N5.14, N6.17, N6.20, N6.33, N6.34, N7.2, N7.10*

Several submissions raised general matters in relation to groundwater. A summary of these is presented in italics following, with a response provided beneath each comment.

*The water resource should be appropriately valued and there are unexplained water losses in the Hunter River. There must be an embargo on all mining that seeks to interfere with the Hunter River and its tributaries and alluviums.*

The water resource is appropriately valued by the *Water Management Act 2000* and its associated WSPs.

As discussed in Section 3.4 above, the predictions in the EA indicate that the proposal will not result in any additional water take to that currently approved. As currently occurs, all water take will be accounted for by the mechanisms provided for under the WSPs.

As reported in Section 3.2 above, prior to mining at Carrington, the groundwater quality within the paleochannel was naturally saline, with an EC typically greater than 8,500µS/cm seeping to the Hunter River. This poor water quality is unlikely to be restored in the long term. Instead, an improved water quality is likely to prevail within the Hunter River alluvium to the south of the barrier wall.

The consistency of the proposal with the relevant objects of the EP&A Act, including ecologically sustainable development (ESD) and 'the improved valuation and pricing of environmental resources', is presented in Section 7.2 of the EA.

The EA assesses the potential for loss of groundwater and surface water from the Hunter River. Comments relating to unexplained water losses in the Hunter River are outside of the scope of this report.

Mining embargoes are a matter for consideration by the government.

*The proposal contravenes original DA that prohibited mining the alluvial lands.*

Development Consent DA 450-10-2003, for operations at HVO North, does not specify that mining in the alluvial lands is prohibited.

*The NSW Planning should commission independent regional water surveys that consider cumulative and long term mining impacts on groundwater and connectivity with river systems, including long term recovery of aquifers breached or disturbed by mining and implications to river flow and other water users.*

This is a matter for the DoP.

*An independent technical assessment of water impacts must be undertaken, including a risk assessment by the insurance industry which can provide financial compensation in the event that the assurances in the EA fail to eventuate.*

A detailed independent assessment of the potential groundwater impacts resulting from the proposal is presented in Section 5.2 of the EA and in the groundwater study (Volume 2 of the EA). In the event that the modification is granted, the proponent has committed to monitoring to verify the predictions and subsequently mitigate its potential impacts.

*The distance of the pit from the Hunter River was also raised as a potential issue.*

The proposed mining area will be isolated from the Hunter River and associated alluvium by a highly impermeable barrier wall, and during mining, by a series of flood levees. Groundwater and surface water technical experts were involved in the design of the proposed pit extension to incorporate amelioration measures into the pit design and minimise potential adverse impacts.

*Potential ramifications of extension to the evaporative sink footprint not fully understood.*

The footprint of the evaporative sink has been extended beyond the original design to account for additional contributions from rainfall and runoff for the proposed extension area. The inclusion of the proposed extension area means there will be a greater volume of water retained behind the barrier walls (east and west channels) which will be of inferior quality when compared to river water. The sink is designed to maintain an inwards hydraulic gradient to the open void, thus isolating the saline water from the Hunter River. Further detail is provided in Section 5.2.2iii of the EA and Section 5.5 of the groundwater study (EA Appendix C).

*Six to eight wells were operating in the proposed extension area when the mine purchased the land. These will be unable to be reinstated post mining.*

Due to the salinity levels of the groundwater within the paleochannel alluvium it has no beneficial use. There are no wells currently operating within the proposed extension area.



## 4 Surface Water

### 4.1 Assessment approach

**Submissions** – C27.10, C62.11, C62.24, N1.1, N5.9, N6.38, N6.39, N9.1

The adequacy of the assessment of potential water impacts, including long term impacts, and the accuracy of flood modelling was raised.

Suitably qualified and experienced water engineers conducted the surface water assessment contained in Section 5.3 and Appendix D of the EA. These studies were undertaken in accordance with applicable guidelines stipulated in the EARs. Further, the EA was considered by the DoP during adequacy review and deemed adequate to progress to exhibition. A response to these submissions in the context of groundwater is provided in Chapter 3 of this report.

The flood modelling was undertaken using XP-RAFTS and TUFLOW software, which are widely accepted for this purpose. The modelling included the use flow data in the Hunter River recorded since 1913 to estimate design flood discharges. The detailed methodology is presented in Appendix B of the surface water study (EA Appendix D).

### 4.2 Impacts on the Hunter River

**Submissions** - C5.2, C7.1, C9.1, C10.1, C10.2, C13.2, C14.1, C17.5, C24.4, C26.1, C28.2, C32.8, C38.3, C42.11, C43.1, C43.4, C43.10, C46.2, C46.7, C48.5, C49.5, C49.9, C52.1, C54.1, C60.18, C60.19, C62.2, C62.15, N1.21, N5.13, N6.13, N6.15, N6.16, N6.41, N6.44, N7.5, N9.6, G2.15

Mining in proximity to the Hunter River, the potential for impacts on it and associated adverse impacts on the environment, society and the economy of the region, State and Australia were raised in the above submissions.

A surface water study was undertaken, the results of which are provided in the EA Section 5.3 and the surface water study (EA Appendix D). In summary it was found that, subject to the implementation of the management commitments in Chapter 6 of the EA, there would be no significant impact to Hunter River water quality, quantity, erosion potential or flooding as a result of the proposal. This is due in part to the proposal design, which incorporates a buffer between the top of bank of the river and the flood protection levees of at least 150m, the construction of a groundwater barrier wall, an extended evaporative sink and drainage line diversions, all at considerable cost to the Proponent. Further, given the proposed pit backfilling to natural surface and rehabilitation, removal of levees and reinstatement of the Unnamed Tributary, the potential impacts documented in the surface water section of the EA would be temporary. In response to a submission regarding potential alterations to the hydrological function of the landscape, given that the landform within the footprint of the pit extension will be returned post-mining, this would address reinstatement of the hydrological function.

Submissions that were focussed on specific matters in relation to the Hunter River are addressed following.

#### 4.2.1 Flows

**Submissions** - C6.3, C9.4, C10.3, C11.3, C12.3, C13.2, C14.1, C15.4, C16.3, C18.3, C19.2, C20.3, C22.3, C25.3, C26.1, C28.2, C29.3, C30.1, C30.2, C31.3, C32.6, C33.4, C34.1, C34.4, C35.7, C36.3, C37.3, C38.3, C44.5, C44.7, C45.13, C47.1, C47.6, C48.5, C48.14, C51.3, C54.5, C56.3, C56.6, C57.3, C60.19, C61.2, N3.3, N4.6, N6.15, N9.6

Submissions raised the potential for loss of Hunter River flows, including base flows over the longer term, and associated impacts to water users, water security and the environment.

Section 3.4 provides a discussion of groundwater related impacts to Hunter River base flows.

In regards to surface water runoff, as stated in the EA Section 5.3.2 and Appendix D, annual average reduction in surface water runoff to the Hunter River due to the entire HVO North operation, including the proposal, is predicted to be 136ML/ annum in Years 1 to 3 of the proposal and 79ML/ annum in Years 4 to 6. This equates to between 0.03 per cent and 0.02 per cent of the annual average Hunter River flow, which is 421,000ML/ annum. The catchment would be largely restored at the end of mining and accordingly, this constitutes a small, temporary loss of surface flow, which is not likely to have a discernible impact on water users, security or the environment.

#### 4.2.2 Cumulative impacts

**Submissions** - C48.5, N1.21

It was submitted that existing and proposed coal mining operations in the Hunter Valley have a major cumulative and degrading impact on the health and functionality of the Hunter River system, and cannot be considered in isolation. The ongoing loss of groundwater connectivity, base flows, and surface stream integrity through diversions has not been seriously considered or clearly documented.

The proposal has minimal change from the existing Carrington Pit. The proposal has considered the potential cumulative impact of the loss of catchment flow by committing, at substantial cost, to temporary diversions of surface water, backfilling the pit and reinstating the natural ground levels at the end of the proposal. Any potential loss of surface runoff would be limited to the life of the proposal with no long term impacts on Hunter River flow. In addition, the Proponent has an extensive rehabilitation program across all its mines to maximise the area that can drain back to the river and minimise the cumulative impacts on the loss of catchment flow.

Matters related to groundwater are discussed in Chapter 3.

#### 4.2.3 Water quality

**Submissions** - C5.2, C21.1, C21.2, C32.2, C44.7, C45.13, C49.9, C59.5, C62.5, C62.15, C62.25, C62.27, N4.6, N7.5, N9.6, G1.11

Concerns were raised about the potential for impacts on water quality of the Hunter River. This matter was addressed in Section 5.3 of the EA and in the surface water study (EA Appendix D). In accordance with existing operations and the commitments in Chapter 6 of the EA, management measures would be implemented during land disturbance and mining to minimise the potential for adverse impacts on runoff water quality. The proposed diversions and levees are expected to have little impact on runoff water quality and the catchment is proposed to be rehabilitated after mining. Any releases to the Hunter River would only be following treatment in sedimentation basins and would be in accordance with the Hunter River Salinity Trading Scheme (HRSTS) rules, to control salinity. Site water balance modelling results

presented in Chapter 4 of the surface water study (EA Appendix D) demonstrated that HVO North, inclusive of the proposal, could continue to operate in compliance with the HRSTS. Water quality monitoring will be ongoing in the Hunter River, with results reported in the AEMR. The potential for contamination via underground aquifers is discussed in Section 3.3.

One submission specifically raised the potential for soil in the project area and used in construction of the levees to wash into the river, causing sedimentation. As stated in Section 3.2.3 of the EA and Chapter 4 of the soils and land resource study (EA Appendix E), soil management practices, rehabilitation and final landform design and implementation will address landform stability and erosion and sediment control. This will include grading to produce slope angles, lengths and shapes which are not prone to an unacceptable rate of erosion, structural soil conservation and drainage works such as contours, sediment control dams and revegetation. A detailed erosion and sediment control plan will be developed prior to commencement of construction which will address potential erosion from the levee construction.

#### 4.2.4 Flooding

##### i Flood impacts

**Submissions** - C5.3, C41.4, C42.19, C42.23, C43.1, C45.1, C45.8, C46.4, C57.4, C59.4, C60.13, C62.15, C62.24, C62.28, N4.5, N6.38, N7.8

Increased flood heights and inundation areas and associated impacts on property, farmland and infrastructure, including economic consequences and compensation were raised in several submissions. The potential for downstream erosion from increased flood velocities was also raised. More general concerns were expressed regarding interference with flood plains.

The EA included hydraulic modelling of the proposal, inclusive of the proposed levees, to determine the potential for flooding impacts on properties. The results are presented in Section 5.3 of the EA and the surface water study (EA Appendix D). The modelling predicted that a maximum increase in Hunter River flood levels from the proposal would be a 0.1 to 0.14m increase for the 100 year average recurrence interval (ARI) event, at some locations on lands owned by the Proponent. There are no buildings within this zone.

There would be no virtually no change (zero to less than 0.05m increase) to flood levels for this event on land that is not owned by the Proponent, either downstream or upstream of the project area. Smaller changes were predicted for the more frequent floods (i.e. less than the 100 year ARI). The predicted increase to flood heights on the Proponent's land are not significant, particularly when considering the existing flood depths at these locations, which are generally around 5m to 6m. Given that flood levels and velocities along the Hunter River channel were found to be virtually unchanged by the proposal for events up to and including the 100 year ARI event, there is predicted to be no increase in erosion potential due to the proposal.

In line with the zero to minimal increases to flood heights predicted, comparison of flood maps for the existing (and end of mine) case provided in Figures 5.1 and 5.2 of the surface water study (EA Appendix D) against those with the proposed levees in place, shown in Figures 5.5, 5.6, 5.11 and 5.12, demonstrate that inundation of additional land due to the proposal during the 10 and 100 year ARI events would be negligible.

As stated in the EA, the levees would be removed at the conclusion of mining and the ground levels returned as close as possible to the pre-mining landform. Accordingly, there would be no flood impacts resulting from the proposal following closure and rehabilitation.

One respondent mentioned that the EA stated a 1m rise in the Hunter River level due to the proposal. The EA predicts a zero to 0.14m rise in flood heights along the Hunter River for the 100 year ARI event, not 1m as suggested in the submission.

## ii 1955 flood

**Submissions** - C42.20, C42.21, C45.9, C49.3, C49.4, C62.28, N6.39

The following matters were raised with reference to the 1955 flood, which is the largest on record for the area:

- the EA does not address the 1955 flood event;
- the 1955 flood would inundate the pit and workings with consequences for water and land quality; and
- a larger area of private property would be affected by a flood of the 1955 magnitude due to the altered landscape from mining.

Flood modelling was undertaken for a range of design flood events, up to and including the 100 year ARI design event, as is standard industry practice in NSW (refer to the EA Appendix D). Predictions were made using a model which incorporates the surrounding land contours and the proposed mine plan, and thus the existing landscape, as altered by mining was taken into account, as well as the temporarily altered landscape due to the proposal. Flow data from the 1955 flood was included in the data set used to determine the design flood discharges at the site. A peak discharge of 13,000 cubic metres (m<sup>3</sup>) per second was recorded at the Singleton gauge during the 1955 flood, which corresponds to an ARI of greater than 150 years. It is likely that the peak discharge at the mine was considerably lower given that it is upstream of the two major tributaries of Glennies Creek and Wollombi Brook, which both contribute to flows at Singleton.

The proposed flood protection levees would be constructed with a crest height that is 0.5m higher than the 100 year ARI flood level. It is considered that the proposed flood protection measures reduce the risk that the pit would be inundated to an acceptable level, given that the proposed life of the proposal is only six years. Should a flood event greater than the proposed levee heights occur during the life of the proposal, the Proponent would be required to manage the pit water within its existing site water management system. After the proposed six year life span of the proposal the land would be restored and there would be no impact on flooding.

The proposed pit extension is located in a backwater of the Hunter River and not in an 'active' flow zone. Therefore, it is the opinion of the specialist water engineers WRM, that a larger flood would not impact on private property significantly more than the 100 year ARI design flood.

## iii Flood assessment locations

**Submissions** - C42.21, N6.38

The following matters were raised regarding the extent of the flood model:

- the maps show flood heights for the mine lease area only; and
- flood levels should be estimated and mapped for the Lemington Road bridge.

Figures 5.1 to 5.16 of the surface water study (EA Appendix D) depict predicted flood depths and velocities over an approximate 34 square kilometre area, including properties upstream and downstream of the proposed extension area and the Lemington Road bridge, located upstream of the mine lease. The results are also presented in tabular form for eight specific locations, including location 'H', which is approximately 900m downstream of the Lemington Road bridge (refer to the surface water study, EA Appendix D, for results). The tables in Chapter 5 show that at location H, there would be no change to flood heights with the proposal in place for the 2 and 5 year ARI events and only a 0.03m increase for the 100 year ARI event.

The model extent is considered appropriate given that depth changes for the 10 and 100 year ARI events would be nil to less than 0.05m for all areas outside of the mine lease, including toward the outer extents of the model. That is, there would be no additional impacts further upstream or downstream of the modelled extent or at the Lemington Road bridge.

#### iv Levee design

##### **Submission - N7.7**

This submission raised proposed flood levees in the context that levees have only been designed for the 1 in 100 year flood. Design of the levees for flood events up to and including the 1 in 100 year event is consistent with standard industry practice in NSW and is considered to be an appropriate level of risk given the proposed six year life span of the proposal. Notwithstanding, as mentioned in Section 4.2.4ii, the levees are proposed to be constructed with a crest height 0.5m higher than the 100 year ARI flood level, which would accommodate a larger flood and should it be overtopped, the proponent would be required to manage the pit water within the existing site water management system.

### 4.3 Unnamed Tributary diversion

##### **Submissions - C34.2, N6.28, N6.30**

These submissions raised matters in relation to the Unnamed Tributary diversion. These comprised the artificial channel not matching the hydraulic, ecological and geomorphological values of the natural tributary and the potential for mining-related impacts on its water quality and quantity, including sediment loading and altered flow rates into the Hunter River. It was also commented that there was insufficient flow data to give confidence that unacceptable environmental impacts would not occur.

As reported in the surface water study (EA Appendix D), the Unnamed Tributary is ephemeral and has already been substantially modified upstream of the proposed extension area. The upstream diversions have no active erosion, are well vegetated and have been constructed with a series of pools and riffles to encourage aquatic habitat. As detailed in the statement of commitments in Table 6.1 of the EA, the proposed Management Plan and detailed design of the temporary diversion would include similar measures to the upstream diversions and include a monitoring regime and contingency measures as required.

The proposed final diversion will reinstate the existing channel as much as practicable such that it performs in a similar manner hydrologically and hydraulically. Similarly it would be vegetated to reflect natural conditions along similar streams in the region. It is noted that the ecological survey and assessment (EA Section 5.8 and ecology study, EA Appendix I) found the Unnamed Tributary to be of low aquatic habitat significance and that natural hydrological regimes had been altered by previous and ongoing land uses, including clearing and grazing. Accordingly, the proposed revegetation strategy for the final diversion would be expected to enhance riparian conditions from their existing state. Further response in relation to the ecological values of the Unnamed Tributary is provided in Section 11.1.

Flow data is not available for the Unnamed Tributary, however, observations indicate that, as stated in Section 4.4 of the ecology study (EA Appendix I), it is ephemeral and flows are only established for short periods following rain events. It was predominately dry at the time of the surveys undertaken for the EA. These characteristics are consistent with the upstream reaches which have previously been realigned. The geometry of the existing channel and catchment provides sufficient information for water engineers to design the diversion to adequately convey runoff from the catchment. The flood modelling results in Section 5.3.2 of the EA and Chapter 5 of the surface water study (EA Appendix D) indicate that runoff from the Unnamed Tributary catchment would be effectively conveyed around the levees by the proposed diversion.

No significant water quality impacts are anticipated in association with the Unnamed Tributary diversion given the following aspects of the water management plan and channel design, which were set out in the EA (Section 5.3 and Appendix D):

- there would be no discharge of runoff from mining disturbed areas to the diversion channel - it would be collected and treated for sediment prior to reuse or any discharge from the site;
- sediment and erosion control measures would be implemented during construction;
- the diversion would be much flatter and longer than the original channel, meaning it would be less conducive to erosion and sediment would be more likely to drop out of suspension; and
- any releases of mine water would be in accordance with the HRSTS rules.

With respect to flow impacts, whilst the EA acknowledges that the pit would temporarily subsume an area of catchment, the diversion channel design would be free flowing and would not result in loss of flow to the Hunter River.

In response to a submission that watercourses above the mine will lose flow, it is noted that the only watercourse within the proposed extension area is the Unnamed Tributary. The proposal includes the temporary diversion of this channel around the mining area, to maintain flows, and reinstatement to its original position at the conclusion of mining. Part of its catchment, within the active mining area, would be temporarily isolated, however, this is necessary to manage water quality and would be rehabilitated at the end of mine life.

#### 4.4 Water use

##### **Submissions** - N5.9, N6.7

Matters related to sustainable water use were raised. The proposal does not involve any significant changes to water use, demand or operation of the HVO North water management system from the currently approved operation. Water balance modelling for Years 3 and 6 of the proposal found that forecast HVO North water demands, inclusive of the proposal, could be met by reuse and recycling of mine water, without any extraction from the Hunter River (refer EA Appendix D).

#### 4.5 Water management and monitoring

##### **Submissions** - C42.28, C43.11, C62.5, N5.2, N6.5, N6.27, N7.5, G2.3, G2.15

Matters related to water management and monitoring were raised in submissions. Water management and monitoring at HVO North, inclusive of the proposal, will continue to be undertaken in accordance with the HSEQ Management System procedures and the HVO Water Management Plan. This includes a

rigorous monitoring program, the results of which will be reported in the AEMR. The surface water monitoring network is illustrated in Figure 2.6 of the surface water study in the EA Appendix D, and includes the Hunter River upstream and downstream of the proposed extension area. Proposed groundwater monitoring is discussed in Section 3.7.

Regarding triggers and techniques for remediation, in the event that serious damage such as cracking occurs, detailed modelling and analysis by specialist water engineers WRM found that no significant impacts to the Hunter River are anticipated. The predicted impacts are as described in the EA. The proposal does not involve any mining beneath the Hunter River or other streams and therefore would not result in any cracking. Erosion of the Hunter River is a natural process that is expected to occur over the life of the proposal and beyond regardless of the whether the proposal proceeds, and remediation measures are currently implemented by others to alleviate this. However, as stated in Section 5.6 of the surface water study (EA Appendix D) and reiterated in Section 5.3.2 of the EA, the proposal is not expected to result in any additional erosion along the Hunter River and the risk that the Hunter River could continue to erode northward to reach the groundwater barrier wall is considered extremely low to unlikely given the geology.

Notwithstanding the above, the triggers for any such remediation are provided by State legislation. The *Mining Act 1992* includes provisions for the Director-General of I&I NSW or an appointed inspector to issue directives to address, prevent, control, mitigate or remediate environmental aspects(s) that are, or may be, affected by activities undertaken under the mining lease. In addition, the *Protection of the Environment Operations Act 1997* includes triggers for DECCW (or the appropriate regulatory authority) to issue directives for action in the event of pollution or other environmental harm.

#### 4.6 Other matters related to surface water

**Submissions** - C9.1, C10.2, C17.1, C33.4, C43.7, C62.7, N5.14, N6.2, N6.7, N6.13, N6.20

Several submissions raised broader matters such as the need for an independent technical assessment; mining buffers from rivers; embargos on mining; protection of water security and drinking water supply catchments; and existing stressors on the Hunter River. These are summarised in Appendices A and B of this report, however, are issues for consideration by government authorities and are beyond the scope of the EARs and the Proponent's application to modify the existing Development Consent.

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## 5 Soils and agriculture

### 5.1 Impact on agricultural land

**Submissions** - C5.1, C6.2, C9.3, C10.7, C11.2, C12.2, C13.3, C14.2, C15.3, C15.5, C16.5, C17.2, C18.2, C19.4, C20.2, C22.2, C24.2, C25.2, C26.3, C28.1, C29.2, C30.3, C31.1, C31.5, C32.4, C32.8, C33.2, C34.5, C35.4, C36.2, C37.2, C38.2, C41.1, C41.3, C42.7, C42.9, C42.10, C42.12, C42.18, C42.31, C44.1, C45.1, C45.2, C47.5, C46.6, C46.7, C48.2, C51.2, C52.2, C54.4, C55.3, C56.2, C57.1, C57.2, C57.7, C59.3, C61.1, C62.16, C62.3, C62.15, C62.29, N1.12, N1.13, N1.14, N1.15, N2.8, N2.10, N3.5, N4.4, N4.7, N5.1, N6.41, N7.3, N9.3, N9.16, N9.17

Several submissions raised the matter of mining high quality agricultural lands and contended there would be a loss of agricultural performance post-mining. Submissions also referred to the cumulative loss of prime agricultural land in the region. These matters were raised in different ways, such as:

- the proposal would result in the cumulative loss of Class 1 and 2 agricultural land;
- the proposal would lead to the loss of prime agricultural land;
- mined land cannot be rehabilitated to be in as good a condition agriculturally as the original land; and
- rehabilitation projections require substantiation.

As indicated in Section 5.4 and Appendix E of the EA, the land within the project area has been classified using agricultural suitability classes. This was based on soil test results and landform analysis. The assessment outlines that there is no land classified as Class 1 agricultural suitability within the proposed extension area and none will be impacted by the proposal. The proposed extension area includes 65ha of Class 2 agricultural suitability, which is proposed to be rehabilitated back to Class 2 suitability at the conclusion of mining. Class 2 agricultural suitability land is considered to be highly productive, suited to regular cultivation and both row and field crops. Extensive land and soil management and considerable investment by the Proponent are proposed to achieve the rehabilitation outcomes.

The proposed extension area is located entirely on lands owned by the Proponent. Mining within the proposed extension area will be temporary, restricted to the proposed six year period, after which it will be rehabilitated back to an equivalent agricultural suitability. As such, the proposal would not contribute to any long term cumulative loss of prime agricultural land.

The proposed rehabilitation of land to Class 2 agricultural suitability is consistent with the Proponent's experience at the adjacent Alluvial Lands, where 63ha of land was successfully rehabilitated with crop yields at least equivalent to those on nearby farms. Further discussion of this project is provided in Sections 6.1 and 6.2.

In summation, it is anticipated that the high quality agricultural land to be restored post-mining will not deteriorate in performance from its pre-mining condition.

A submission raised that a potential area of future mining on high value alluvium to the south of the proposed extension area had been flagged. Another submission raised destruction of additional alluvial flats closer to the Hunter River. The proposal does not involve any mining outside of the proposed extension area identified in the EA. Any future mining proposals would need to undertake appropriate assessments and require consideration under the relevant regulatory regime in place at the time.

Finally, a submission raised that in most cases mine-owned farm land is not farmed with the same practices and level-of-care as private farms. Farm land owned by the Proponent is typically leased to private farmers, and strict conditions on land management are applied as part of the lease arrangement.

## 5.2 Precedent setting

**Submissions** - C6.5, C8.2, C9.5, C10.8, C11.5, C12.5, C14.5, C15.7, C16.2, C18.5, C20.5, C22.5, C23.2, C25.5, C26.4, C29.4, C30.4, C33.6, C36.5, C38.5, C47.8, C48.3, C51.5, C54.7, C60.20, N1.17, N2.6, N4.8

These submissions contended that approval of the proposal will set a poor precedent, threatening the rest of the Hunter alluvium. This matter is discussed in Section 3.2 of this report.

## 5.3 Food security

**Submissions** - C10.5, C13.4, C15.6, C17.4, C24.3, C31.2, C33.3, C34.6, C41.7, C42.17, C43.3, C44.3, C45.3, C47.2, C48.4, C49.2, C62.1, N6.41

These submissions contended that the proposal will have an adverse impact on food production and security.

As indicated in Section 5.1 above, the capacity for agricultural production from the rehabilitated land is not projected to diminish in comparison with current capacities. Any impact on food security would be very minor and relatively short-term, i.e. during the active mining of parts of the 137ha proposed extension area, given the proposal to restore the Class 2 agricultural suitability lands. Additionally, the productivity of the proposed extension area, before and after mining, would be comparable, as demonstrated with the Alluvial Lands project and therefore the proposal is not likely to significantly affect the overall productive capacity of the Hunter Valley, the State or the nation.

## 6 Rehabilitation

### 6.1 Effectiveness of rehabilitation

**Submissions** - C5.8, C12.2, C34.10, C41.3, C42.9, C42.10, C42.14, C43.2, C44.2, C45.1, C45.4, C47.5, C49.1, C56.2, C57.5, C60.13, C60.15, C61.1, C62.17, C62.18, N1.14, N1.19, N1.22, N1.23, N6.11, N7.4, N9.15, N9.18, G2.2

These submissions contended that mined land cannot be successfully rehabilitated and made productive for future agricultural enterprises. Some submissions also indicated that it would be too costly to maintain rehabilitated land in a productive state. Points made include:

- topsoil depth of 30cm over mining rubble has proven at HVO and elsewhere to be inadequate for supporting the original ecosystems and pasture and/ or woodland;
- the rehabilitated land will be impossible to farm due to loss of alluvium and alluvial aquifers;
- it is impossible to restore land to Class 2 as the topsoil will sit on unconsolidated mine spoil which will settle and create land contours unsuitable for intensive agriculture, farm machinery, fencing and building;
- rehabilitation cannot be relied on to return the land to the Class 1 or 2 agricultural land it once was, as the amount of money required to sustain it at that level would be economically unviable for any farming enterprise;
- rehabilitated lands will not be capable of supporting economically viable agricultural enterprises; and
- the existing levee should be removed and the alluvial lands rehabilitated prior to the extension commencing to prove the Proponent can return the environment back to a satisfactory pre-mining state.

As indicated in Section 5.1, based on experience in the adjacent Alluvial Lands, the Proponent is confident it can rehabilitate the land successfully. At the Alluvial Lands, 63ha of land was successfully rehabilitated to Class 1 and 2 lands, with crop yields at least equivalent to those on nearby farms. Over time some small depressions caused by the land settling have occurred. The depressions are relatively small in area and can be up to 15cm to 40cm deep, but are within the design performance criteria. These were repaired with stored topsoil. Leading practice techniques were used to demonstrate the performance of the Alluvial Lands, including use of irrigation and appropriate fertilisers. Productivity was measured over a three year trial period, ending in 2007, by comparing average crop yields (lucerne hay and silage) in tonnes per hectare at the rehabilitated lands with the average yield for six local lucerne producers. The rehabilitation of the Alluvial Lands was developed in consultation with government agencies and the community, including I&I Minerals and I&I Agriculture. The process included benchmarking, performance criteria, monitoring to demonstrate that the performance criteria had been met and detailed reporting. The long term productivity of the land is the responsibility of the landowner and can be maintained by these leading practice techniques. Similarly, the affects of subsidence can be managed by placement of stored topsoil or levelling with normal farm equipment.

Regarding the comment that the rehabilitated land would not support the original ecosystems, most of the project area is comprised of a modified landscape which harbours little intact native flora, with only small highly fragmented remnants of native vegetation. The Class 2 agricultural suitability land is

intended to be rehabilitated and returned to agricultural uses. Further response to biodiversity matters is provided in Chapter 11. Matters relating to the aquifers are discussed in Chapter 3.

In regards to comments that the existing levees be removed prior to commencement of the proposal, it is noted that these levees are still required for water management purposes and are expected to remain in place for the duration of the proposal. The flood modeling of the proposal took into account the effects of existing levees on the Hunter River floodplain and accordingly, their effects have been accounted for in the EA.

## 6.2 Lack of substantiated performance

**Submissions** – C3.6, C5.9, C41.2, C42.13, C42.14, C43.2, C45.5, C60.16, C62.18, C62.27, N1.14, N9.14, N9.18

These submissions contend that past rehabilitation has not been as successful as claimed. Points made include:

- disputes the crop yields and quality reported for the Alluvial Lands and states that these were not economical;
- disputes success of previous attempts at rehabilitating Class 1 and 2 agricultural lands;
- the previously rehabilitated land cannot be farmed due to subsidence;
- the Proponent claims that its experience at rehabilitating alluvial land has been successful but doesn't state the amount of fertiliser and water used to grow successful crops nor the time a lucerne crop lasts; and
- the DoP should commission detailed assessment of the past success of rehabilitation on similar land.

It is considered that the agricultural productivity assessment undertaken for the 63ha of rehabilitated Alluvial Lands was objective and provides quantitative support to the Proponent's contention that it can and does successfully rehabilitate mined land. As mentioned in Section 6.1, the rehabilitation of the Alluvial Lands project was developed in consultation with government agencies and the community, including I&I Minerals and I&I Agriculture. The process included benchmarking, performance criteria, monitoring to demonstrate that the performance criteria had been met, and detailed reporting. The Proponent does not support the notion that it needs to further prove it can successfully rehabilitate mined land at the site prior to the extension commencing. In regards to the suggestion that the DoP commission a detailed assessment of the past success of rehabilitation on similar lands, the Proponent does not consider that this is warranted, given the productivity assessment referred to above, which was endorsed by the I&I Minerals and I&I Agriculture.

## 6.3 Reuse of alluvial soils

**Submissions** – C6.3, C28.1, C44.4, C45.1, C62.26, G2.10

These submissions variously contended that the proposal will destroy alluvial soils and that the EA does not give clear commitment to retention of all alluvial soils for reuse in rehabilitation and that this should be a condition of consent. Council's submission included matters relating to the proposed depth of topsoil used in rehabilitation.

The Proponent is committed to, where appropriate, reusing the original soils stripped from the site. As stated in Chapter 4 of the soils and land resource study (EA Appendix E), it is proposed to selectively strip and stockpile soil horizons from the Class II alluvial lands, and replace these sequentially, to reinstate the soil profile. This would be addressed in the proposed topsoil management plan. The smaller topsoil re-spreading depths are proposed for areas outside of the Class II alluvial lands.

Conditions of consent, including any relating to soil use and rehabilitation, are determined by the Minister for Planning.

## 6.4 Proposed final rehabilitated landform

### **Submissions** – C46.1, C60.17, C62.6, G2.9, G2.10

The Singleton Council submission raised that rehabilitation should provide woodland areas and agricultural land uses, including irrigated pastures. Submissions also stated that the land must be rehabilitated, the landscape will be permanently altered and the effects of flooding on rehabilitated land are unknown. As described in the EA Section 3.2.3 and depicted on Figures 3.1 and 3.4, the pit void will be sequentially backfilled and re-graded to a similar grade to pre-mining, consistent with the surrounding landscape features. Surface drainage is proposed to be restored to be consistent with the pre-mining drainage patterns, and landform establishment would include surface drainage considerations such as contour furrows, contour banks, sedimentation dams and/ or diversion drains. The mined area will be rehabilitated to provide both grasslands suitable for grazing and cropping, and woodland for biodiversity purposes. Irrigation has been successfully used at the adjacent Alluvial Lands rehabilitation areas.

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## 7 Noise and vibration

### 7.1 Assessment approach

#### **Submissions** - C27.2, C50.6, G1.7

One respondent questioned the accuracy of the noise modelling, citing that modelling suggested a decrease in noise levels. This conclusion was made by comparing the highest noise predictions from the ERM (2003) Environmental Impact Statement (EIS) at each assessed receptor, with those predicted in the current study. For example, the highest noise level predicted at Receptor 2 (the closest receptor to the respondent) was 39dB(A), which is lower than the maximum level of 41dB(A) predicted in the 2003 EIS, and complies with the relevant consent limit of 39dB(A).

It is important to note that these predictions are associated with the worst case weather conditions, i.e. adverse easterly winds of a night, and therefore would be reduced at other times, during more favourable weather.

Whilst the proposal will bring HVO North mining activities closer to some receptors, this did not increase predicted noise levels beyond the maximum levels previously predicted, predominately due to the following:

- at the majority of receptors assessed, noise from the Carrington Pit operations is a minor component of total noise from HVO North, which is dominated by West Pit;
- the modelling used updated HVO North operating scenarios to those used in the 2003 study. Specifically, overburden emplacement activities at the Alluvial Lands, to the south-east of Carrington Pit, have now ceased, and therefore were not included in the current assessment; and
- the proposal does not involve any increase in plant and equipment numbers, and accordingly the modelling simply included a revision of the equipment operating locations used for Carrington Pit in the 2003 study, to reflect the proposed progression of mining to the south-west, rather than any addition of new equipment.

The noise assessment was undertaken in accordance with the DECCW (2000) *Industrial Noise Policy* (INP), using the DECCW accepted Environmental Noise Model (ENM) software. The ENM is a three-dimensional model and includes topography, measured noise emissions from plant and machinery which will operate at HVO North and the effects of prevailing weather conditions. The modelling was considered to be conservative. For example, worst case (in terms of potential noise impacts) mine plans and equipment operating locations were used (refer Appendix A of the noise and vibration study in the EA Appendix F) and simultaneous operation of all plant listed in the plant inventory was assumed (refer Table 3.2 of the noise and vibration study, EA Appendix F).

One submission noted that the EA does not specifically identify noise levels at the closest residence on the neighbouring property (Receptor 10).

Acoustic assessments are typically undertaken at a representative residence for each identified privately owned property, as was the case for this assessment. Three residences were identified on this property, of which the selected assessment location is the middle one. Notwithstanding, the acquisition requirement applies to the whole of this property. Noise contours presented in the noise and vibration study (EA Appendix F) provide a visual representation of predicted noise levels across the broader area, from which potential impacts at other areas and residences on the property can be interpreted.

With regard to the DECCW submission on ENM over predictions, references to field validation studies which have demonstrated ENM over predictions under wind enhanced conditions are provided in Section 3.6 of the noise and vibration study and in the EA Section 5.5.2v. However, it is noted that reductions have not been applied to any of the assessment results in the EA, and therefore the results are considered to be conservative.

## 7.2 Potential noise impacts

**Submissions** - C1.6, C3.4, C4.3, C4.4, C5.5, C27.1, C27.8, C34.9, C40.4, C41.9, C40.4, C43.16, C50.6, C50.7, C59.1, C60.2, N4.3, N7.16

Existing noise levels, increased noise due to the proposal and cumulative impacts, were raised in several submissions. These matters were all addressed as part of the noise and vibration study (EA Appendix F), and summarised in Section 5.5 of the EA. Key findings are reiterated in the following:

- compliance noise monitoring undertaken since 2005 at Jerrys Plains demonstrates that Carrington Pit operations have been within consent limits and inaudible;
- noise from the proposed operations at Carrington Pit is predicted to be a minor component of noise levels at all assessed receptors (other than Receptor 10, which is within a HVO zone of affectation) – noise levels from HVO North are dominated by West Pit;
- the predicted mitigated noise levels from combined Carrington and West Pit operations during adverse INP derived weather conditions are unchanged or lower than the maximum levels predicted in the ERM (2003) EIS at all representative receptors;
- during calm weather, noise levels from HVO North, inclusive of the proposal, are predicted to satisfy consent limits at all private residences not already within a zone of affectation;
- acquisition noise limits will not be exceeded at any of the representative private properties assessed, which are not already within the zone of affectation. At two representative properties assessed, noise levels are predicted to be marginally (1dB) above the operation consent limit during adverse easterly winds. This marginal exceedance is due to the broader mine operations at HVO North and not from the proposed mining within the Carrington Pit extension area. Furthermore, the predicted noise levels under adverse winds are highly unlikely to eventuate in reality due to reasons set out in Section 5.5.2 of the EA;
- cumulative noise levels from the proposal and surrounding mines are expected to comply with the relevant DECCW goal at all private residences not currently within a zone of affectation and where HVO North makes a substantial contribution; and
- a comprehensive noise monitoring and management program is proposed to achieve compliance with the relevant criteria and ensure residential properties are adequately protected, the details of which are included in Section 5.5.3 of the EA and the noise and vibration study (EA Appendix F).

One submission specifically mentioned increased noise emissions from increased road traffic, rail traffic and blasts due to the proposal. It is noted that the proposal does not involve any increase to road or rail traffic, and therefore the proposal would not increase noise from these sources from that generated under the existing approved operation. No change to blast frequencies is proposed. Blasting will be required to meet the current limits at all residences and this will be managed through appropriate blast design and monitoring.



### 7.3 Sleep disturbance

**Submissions** - C3.4, C4.4, C27.8, C50.7

Night time noise impact and sleep disturbance, which is reportedly an existing issue for some nearby residents was also raised in several submissions. The assessment results discussed above in Section 7.2 provide a response to the matter of night time noise. In addition, the noise and vibration study (EA Appendix F) includes a specific assessment of the potential for sleep disturbance, which looked at the maximum noise levels under adverse winds from the noisiest transient sources, such as shovel gates banging, truck movements and vehicle reversing alarms. This assessment found that maximum noise levels under these conditions would be within the DECCW's sleep disturbance criterion at all assessed receivers other than Receptor 10, which is already within a HVO zone of affectation. The full set of results is provided in Section 5.5 of the EA and in the noise and vibration study (EA Appendix F).

### 7.4 Noise management

**Submissions** - C50.6, N5.2, G1.9, G2.6

The owner of the neighbouring property which corresponds to Receptor 10 in the EA submitted that the EA does not identify mitigation measures to reduce predicted noise at this receptor to acceptable levels. Proposed noise management and monitoring measures are detailed in Section 5.1 of the noise and vibration study (EA Appendix F), and include HVO's existing practices as well as new commitments. This property is already within a HVO zone of affectation due to the existing approved operations at HVO North, and this remains the case with the proposal. It is understood that the Proponent is liaising with the property owner on mitigation and compensation matters.

Singleton Council submitted that consideration should be given to limiting night time mining operations. While the proposal is predicted to result in similar noise levels to the existing Carrington Pit, the approach to the management of noise from the whole of HVO North was considered as part of the EA. The resultant noise management commitments, which were developed additional to the existing measures, were driven by night time noise under adverse winds. These measures are described in Section 5.5.3 of the EA and the noise and vibration study (EA Appendix F). They include permanent real time directional noise monitoring at Jerrys Plains with back-to-base feed of data and trigger alarms, research on the use of predictive weather forecast data as a tool to manage noise, and contingency mine planning for events such as wind conditions that have the potential to increase noise beyond acceptable levels, e.g. locating equipment in shielded or bunded areas during adverse conditions. The DECCW submission expressed support for the Proponent's noise management commitments.

Further changes to night time mining operations are not considered necessary at this time due to these commitments and the additional points listed in Section 7.2. Furthermore, advice from the noise expert who undertook the noise and vibration study is that the proposal is not expected to exceed, or even reach, the predicted night-time noise levels. This is due in part to the conservative 'worst case' assumptions and modelling scenarios used in the assessment, such as simultaneous operations of all equipment. In addition, as described in Section 3.6 of the noise and vibration study (EA Appendix F), experience with the modelling process by the noise expert on numerous projects over the past 15 years has shown that the noise model used, ENM, over-estimates noise levels under adverse winds. Finally, the modelling makes a highly conservative allowance for noise shielding effects of the intervening ridgeline to the west of the Carrington Pit under adverse weather, much lower than the extent that would be expected in reality. Hence, actual noise levels associated with the proposal are likely to be lower than those predicted. This would be confirmed by the monitoring proposed.

## 7.5 Blasting

### 7.5.1 General

**Submissions** - C1.6, C3.5, C4.3, C27.3, C50.6

Existing and proposed blasting impacts on property (including cracks in houses), livestock and safety, as well as general concerns regarding increased vibration impacts were raised in several submissions.

The proposal does not involve any change to the existing approved blast frequencies. Blasting will be required to meet the current consent limits at all residences and this will be managed through appropriate blast design and monitoring of all blasts.

An assessment of noise and vibration from blasting within the proposed extension area was undertaken as part of the EA and is provided in Chapter 4 of the noise and vibration study (EA Appendix F). The assessment concludes that current blasting techniques can continue and satisfy appropriate personal annoyance and safe structural limits for buildings with the exception of Receptor 10. As detailed in the statement of commitments in Table 6.1 of the EA, consultation and arrangements will be made with the landowner in advance of any blasts within 900m of the residence. The Development Consent conditions include limits on ground vibration that must be satisfied, and these limits are designed to minimise annoyance from blasting. The EA demonstrates that the prevention of impacts is within the realm of practical limits for blast designers and that normal blasting practices can continue to occur. The 5 millimetres per second (mm/s) blast ground vibration consent limit can be achieved at 'all residences not currently within a zone of affectation'. All future blasting will continue to be monitored to ensure vibration levels meet appropriate limits, and will be reported in the AEMR.

The potential for blasting impacts on livestock was discussed in Section 4.2 of the noise and vibration study (EA Appendix F) and was considered to be minimal. Notwithstanding, it was stated that very little published evidence is available about direct impacts of blast noise on livestock.

### 7.5.2 Neighbouring property

**Submissions** - C50.8, C50.9, C50.10, C50.11, C50.12

The owner of the neighbouring property which corresponds to Receptor 10 in the EA raised issues specifically relating to blasting impacts on this property. These are summarised as follows:

- Potential impacts closer than the assessment location adopted in the EA, including at a residence, cattle yards and stables, citing nominal distances of 900m to 1500m from the blast site, and specifically:
  - blast overpressure if larger charge masses were used;
  - size of charge required to give 10mm/s and 5mm/s peak particle velocity (ppv) at these distances; and
  - fly rock risk to person and livestock from blasting within 500m, e.g. at the cattle yards, noting that farm management practices should not be expected to change to accommodate blasting.

Further blast modelling is being undertaken for this property, using site specific data, including geological data and historical recorded data from blasting at Carrington Pit. The Proponent is liaising directly with

the property owner regarding potential blasting impacts and control and mitigation options. In addition, notification and consultation regarding this issue is proposed in advance of blasting which may affect this property. This is reflected in the statement of commitments for the proposal (refer to Chapter 6 of the EA).

## 7.6 Criteria

### ***Submissions - N9.12, G1.8***

The DECCW recommended that, at this time, the current consent limits for noise should not be changed. The Proponent confirms that no change to the existing consent limits is proposed.

The NSW Farmers Association submitted that permitted noise levels are routinely exceeded in the area, with no enforcement action by government. Compliance is reported in the AEMR, which is publicly available and is submitted to government for review and response. Directives for management action e.g. mitigate and re-monitor, may be issued by government authorities, if required.

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## 8 Air quality

### 8.1 Assessment approach

#### 8.1.1 Receptor selection

##### **Submission - C50.14**

The owner of the neighbouring property which corresponds to Receptor 10 in the EA submitted that the EA does not specifically address the dust impact at one of the residences and the hayshed, stables and yards on this property, other than in the contour diagrams.

Where there are several residences or work areas on a property, air assessments are typically undertaken at a representative location, as was the case for this assessment. The air dispersion contours provided in the air quality study (EA Appendix G) reasonably show modelled particulate concentrations and dust deposition at other areas of the property. It can be seen from these contours that the annual average total suspended particulates (TSP), PM<sub>10</sub> and dust deposition levels are predicted to remain well below the criteria at all areas of the property.

It should be noted that naturally occurring dust concentrations in a hayshed and stables are likely to be higher than the levels contributed from the more distant mining activities. For example Flemming *et al.* (2008) cites average PM<sub>10</sub> levels for wheat straw used for horse bedding to be above 200µg/m<sup>3</sup>.

#### 8.1.2 Blasting

##### **Submission - N8.13**

One submission stated that the EA does not provide details of how blasting impacts were included in the air quality modelling. However, all information related to the parameters used and the way in which blasting emissions were calculated can be found in the air quality study (EA Appendix G). This includes the blast emission factor equations, assumed blast areas, number of blasts per year and the annual particulate matter emission estimates factored into the air dispersion model (refer Table 5.1 and Appendices D, E and F of the air quality study). In addition to particulate matter emissions, the air quality study included emissions of greenhouse gases (GHGs) from blasting in the GHG assessment. The specific carbon dioxide equivalent emissions from blasting incorporated in the GHG calculations are provided in Table 8.3 of the air quality study (EA Appendix G).

#### 8.1.3 Dust assessment

##### **Submissions - N8.12, N9.10**

The NSW Farmers Federation submitted that the treatment of dust impacts is inadequate and a 24 hour assessment averages dust levels over the period and disguises the intensity of events. This submission quotes a report other than the Carrington West Wing EA, so it is unclear if the submission is in relation to this proposal. Notwithstanding, it is noted that the air quality study was undertaken with regard to the methods set out in the DECCW (2005) *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*, which requires assessment of 24 hour average PM<sub>10</sub> concentrations.

One submission was made regarding assessment of dust for its chemical composition. As mentioned above, the air quality assessment was undertaken generally in accordance with DECCW (2005) methods.

This does not include any requirement for assessing the chemical composition of dust. In any case, dust associated with coal mining activities is predominantly of a crustal nature (soil).

#### 8.1.4 Cumulative assessment

##### **Submission - N8.11**

The cumulative assessment methodology is summarised in Section 5.6.2 of the EA and is set out in detail in the air quality study (EA Appendix G). The cumulative assessment was undertaken generally in accordance with the methods prescribed by DECCW (2005). It included maximum emission estimates from the most recent air quality assessments available for each of the surrounding mines, namely Ravensworth/ Narama, Wambo, HVO South (Cheshunt and Riverview Pits) and Cumnock mines. Locations of modelled dust sources are provided in Figures 6.1 and 6.2 of the air quality study. As stated in Section 6.3 of the air quality study (EA Appendix G), background levels were established by using local air monitoring and modelling data. The average measured level for each parameter was determined and the contribution from local mines (ascertained from the publicly available modelling results) was then subtracted. Background levels are thus considered to comprise *all* non-mining dust sources. This is a conservative approach, and the resulting background levels adopted are considerably higher than those which have historically been used for air assessments in the Hunter Valley.

#### 8.1.5 Revision of assessment

##### **Submissions - G1.1, G1.2, G1.3, G1.4, G.15**

The DECCW recommended that the DoP should include a condition of approval for an updated air quality assessment, which uses a technique from the US EPA AP-42 for estimating wheel generated dust emissions, provides details of all factors which may influence wheel generated dust emission rates, such as speed limits, considers cumulative 24 hour maximum PM<sub>10</sub> concentrations and demonstrates that the emission controls are in accordance with leading practice. The adoption of such conditions of consent is a matter for the Minister of Planning.

In relation to the emission technique used to estimate dust from haulage, DECCW has not provided a reference to which equation in US EPA AP-42 they would prefer to be used, or the parameters used in the equation to arrive at the figures noted in its submission. The equation PAEHolmes has used for this assessment relates to historical measurements made specifically for mining operations in the Hunter Valley and is considered to be appropriately conservative for this assessment.

The emissions inventory is provided in Appendix E of the air quality study (EA Appendix G). It is noted that the technique applied by PAEHolmes considers vehicle capacity, and not vehicle mass as DECCW states may be partially underestimated. The capacity is used to determine distances that would be travelled to accommodate the assumed throughput. If vehicle capacity is underestimated this would lead to overestimated vehicle kilometres travelled, i.e. more trips would be required to transport the assumed throughput, and hence overestimated haulage dust emissions. Further, the emission estimation technique used does not include vehicle speed as a variable. This is also the case for the equation that appears to be most relevant in the US EPA AP-42, as referred to by DECCW. As such, it is not clear how vehicle speed can be reasonably considered per the DECCW request. Given this, it is not considered necessary to update the emissions inventory; the existing emissions do not appear to be underestimated.

The core elements of leading practice included in the proposal are efficient mine design leading to reduced dust emissions, effective control and management of dust, and effective monitoring for continuous improvement and response to short term events.

## 8.2 Dust impacts

**Submissions** - C1.1, C3.1, C5.6, C27.4, C34.8, C40.2, C41.8, C43.15, C49.10, C50.13, C50.15, C59.2, C60.2, N4.1, N7.15, N8.8

Several submissions expressed concerns about increased dust due to the proposal. Specific matters raised included:

- potential for increased fine particulates;
- more frequent exceedances of the National Environment Protection (Ambient Air Quality) Measure (NEPM) standard for PM<sub>10</sub>;
- dust deposition on residences and pastures;
- potential dust-related impacts on the business of one respondent, being a thoroughbred horse breeding and rearing business;
- cumulative impacts from mining activities and power stations (existing and proposed); and
- perceptions of an 'increased dust problem' by residents and workers at a neighbouring property.

Air quality modelling and assessment undertaken by PAEHolmes found that future annual average PM<sub>10</sub>, TSP and dust deposition levels are predicted to remain well below the DECCW criteria at all receptors assessed. This was the case when taking into account the predicted emissions from HVO North, with the proposal, as well as from surrounding mines and other particulate matter sources in the area. The Carrington West Wing extension is only a small component of the overall operations at HVO North.

In Year 1 of operations, DECCW's 24-hour average PM<sub>10</sub> criterion of 50 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) was predicted to be exceeded by  $0.5\mu\text{g}/\text{m}^3$  on one day at one receptor (Receptor 10), due to the total HVO North operations. The maximum 24-hour average PM<sub>10</sub> concentrations were predicted to be below the criteria at all other receptors during Year 1 and at all receptors during Year 5; Years 1 and 5 were assessed as they represented the worst case years of the proposal in terms of potential air impacts. More detail regarding the air assessment and results is provided in Section 5.6 of the EA and the air quality study (EA Appendix G).

The NEPM standard for PM<sub>10</sub> relates to maximum 24 hour average PM<sub>10</sub> and is the same as the DoP acquisition criteria for this parameter, being five exceedances per year of the  $50\mu\text{g}/\text{m}^3$  criteria. The air quality modelling found that the proposal would not result in any exceedances of this criteria (refer EA Section 5.6.2 and Appendix G).

## 8.3 Dust monitoring and management

**Submissions** - C3.1, C43.18, C60.3, N5.2, N5.15, N8.3, N8.14, N8.15, N9.11, G2.7

Submissions in relation to dust monitoring and management are summarised as follows:

- need for real time PM<sub>10</sub> and PM<sub>2.5</sub> monitoring in the community;
- appropriate air quality monitoring should be continued at Jerrys Plains and other sensitive receptors;

- need for regional monitoring by an independent authority;
- dust and gases from current mining are not controlled adequately;
- management commitments are vague and unenforceable;
- the EA does not state the dust controls to be implemented; and
- too great a reliance is placed on zones of acquisition to address dust impacts.

Air quality monitoring and management is and will continue to be undertaken at HVO, inclusive of the proposal, in accordance with DECCW requirements, conditions of consent, the ISO 14001 certified HSEQ system and the HVO Dust/ Air Quality Management Plan. This includes compliance with statutory and regulatory requirements for dust management, as a minimum. The air monitoring network surrounding HVO is shown on Figure 2.1 of the air quality study (EA Appendix G), and includes high volume air samplers at Jerrys Plains and four other representative receptor locations, as well as dust deposition gauges at representative receptor locations and within the mine site boundaries. Specific dust control procedures to be implemented are presented in Table 5.15 of the EA. No air quality related requirements for acquisition were identified in the EA (refer to the EA Section 5.6.2).

It is noted that separate to this proposal, the NSW Government, in partnership with the Upper Hunter coal and power industries, is establishing an Upper Hunter Air Quality Monitoring Network, in which the Proponent is an active participant. This will include up to 14 air quality monitoring stations across the region. Each station will continuously measure PM<sub>10</sub>, wind speed and wind direction. Three stations will also monitor PM<sub>2.5</sub> in real time. Further details are provided on the DECCW website at <http://www.environment.nsw.gov.au/aqms/upperhunter.htm>.

## 8.4 Other matters related to air quality

### **Submissions – C3.1, N8.2, N8.6, N9.12**

One submission raised that all additional industrial developments should be required to make no net increase in TSP or fine particulate matter PM<sub>2.5</sub> or less, and the Director-General's requirements for air quality and health risk assessments should be based on no more than a PM<sub>2.5</sub> criteria.

These are issues for consideration by the regulatory authorities. The Proponent has adopted the relevant DECCW accepted criteria and conducted the EA in accordance with the EARs.

One submission stated that permitted dust levels are routinely exceeded in the area with no enforcement action by government. Compliance is reported in the AEMR, which is publicly available and is submitted to government for review and response. Directives for management action e.g. mitigate and re-monitor, may be issued by government authorities, if required.

The potential for additional gas pollution was raised by one submission. A GHG assessment was undertaken, which addressed carbon dioxide, methane and nitrous oxide. It was found that there were unlikely to be any measurable environmental effects due to GHG emissions from the proposal. Otherwise, the EA focussed on particulate emissions, as gas emissions, such as exhaust emissions, would be too small and widely dispersed to give rise to significant off-site concentrations. The proposal does not involve any change to plant and equipment numbers or blasting frequencies from that currently approved and therefore would not be expected to result in any change to gas emissions. Emissions will continue to be managed in accordance with Rio Tinto Coal Australia's ISO 14001 certified HSEQ system.



## 9 Health

### 9.1 Dust

#### 9.1.1 General

**Submissions** - C1.5, C3.2, C4.1, C5.7, C35.8, C40.3, C41.10, C43.17, C49.11, C60.2, N4.2, N8.4, N9.13

Health impacts of particulates, even if they are below guideline levels were raised in several submissions. Existing dust-related health issues experienced by local residents such as allergies, sinus and irritated eyes were also mentioned, along with cumulative impacts from mining within the region.

As outlined in the EA, the air quality study for the proposal found that future annual average particulate matter concentrations and dust deposition levels in the local area would remain well below the relevant DECCW (2005) air quality criteria. A single receptor was predicted to experience a small exceedance of the 24-hour PM<sub>10</sub> criterion on one day in Year 1 of operations. These criteria reflect the current Australian community standards for the protection of health and protection against nuisance effects of airborne and deposited dust. They have been developed by the National Environment Protection Council, National Health and Medical Research Council, National Energy Research, Development and Demonstration Council and the DECCW respectively.

In addition, NSW Health undertook a series of health studies in response to the concerns raised by the Singleton Shire Healthy Environment Group and found no statistically significant evidence that people's health was adversely affected by emissions due to coal-mining and/or coal-fired power generation. These reports are publicly available on the NSW Health's website and investigate a range of conditions including respiratory and cardiovascular diseases and cancer rates. According to this research, the Lower and Upper Hunter areas show similar health issues to those seen across rural NSW. It was also found that while the open-cut mining activity had expanded six-fold during the thirty years to 2008, there was no evidence of an increasing lung cancer (the only cancer known to be associated with air pollution) death rate in NSW Health from 2000 to 2008 (NSW Health, 2010a). Further discussion of these studies is provided in Section 9.2.

#### 9.1.2 Drinking water

**Submissions** - C4.2, C50.15, C60.4

Community members raised concerns about dust contamination of drinking water, including roof collection systems.

Recent research into potential health risks from coal dust deposited on rooftops entering rainwater tank systems is discussed below.

A study by NSW Health (2010a) found that:

- the drinking water supplies for towns near extensive open-cut mining and power generation activities are of comparable quality to that of other rural town water supplies;
- the water supplies in the Lower and Upper Hunter, regularly comply with the National Health and Medical Research Council and the Natural Resource Management Ministerial Council (2004) Australian Drinking Water Guidelines (ADWG) for health-related chemicals; and

- the small number of samples which showed moderately elevated levels of some parameters, were likely the result of a natural occurrence in the source water or corrosion of domestic plumbing.

A Queensland study by Lucas *et al.* (2009) found:

- water samples collected from rainwater tanks and taps in the dust deposition zone of a coal mine complied with the ADWG for trace elements, which provide the threshold levels considered safe for human consumption; and
- negligible amounts of trace elements in coal dust are released into rainwater in a tank. This was ascertained by performing leaching tests on numerous coal types, and all trace elements were found to be below the relevant ADWG.

A study focussed on lead levels undertaken by the University of Queensland (Noller, 2009) at mining areas around Camberwell and Muswellbrook in the Hunter Valley found:

- water samples collected from rainwater tanks in proximity to coal mines complied with the ADWG for lead;
- there was no significant difference in drinking water lead levels between houses close to coal mining operations and those at study sites distant from mining activity;
- tank sludge samples appeared to contain lead, however this was not being transferred to water, due to the inherent high pH of the tank water (pH > 7.0). Dust from mines was found to be an unlikely cause of the lead levels, as measured lead levels in dust sources at the mines were significantly lower than in the sludge; lead in roofing materials and paint was a more likely cause;
- there was no detectable lead in ambient air samples of TSP;
- lead content of dust samples taken from floor wipes, window sills and carpets complied with the relevant criteria; and
- lead content of dust samples taken from window troughs complied with the relevant criteria at all but two houses, indicating some localised source of lead at these houses.

Recent testing of water tanks near Mount Thorley Warkworth (MTW), undertaken by the Proponent at the request of the MTW Community Consultative Committee found that:

- no health related concerns were identified in association with quality of any of the tank water which might reasonably be attributable to mining; zinc and aluminium concentrations were below the aesthetic guideline levels;
- several residences had elevated levels of microbiological indicators, i.e. thermotolerant coliforms, related to general maintenance of the tank and rainwater collection systems; and
- sampling of tank sediments indicated that the materials were typical of the earth's weathered crustal material, i.e. dust, and significant amorphous or organic material indicative of coal dust was not detected.

This research does not identify any concerns regarding water quality in rainwater tanks which could be attributed to dust from mining operations. Notwithstanding, as per recommendations of NSW Health (2007, 2008) rainwater tanks should use first flush devices to reduce the amount of dust, bird droppings

and other such material accumulated on the roof being washed into tanks, and inspections for accumulated sludge should be conducted at least every two to three years, with any build up removed.

## 9.2 Independent regional health studies

**Submissions** - C5.7, C35.8, C36.7, C41.10, C49.14, N8.5, N8.9

The Singleton Shire Healthy Environment Group called for an independent health investigation of Singleton Shire residents, in respect of conditions affected by air particulates and toxics. This is a separate matter to the proposed Development Consent modification. However, the results of the independent study undertaken by NSW Health, released on 5 November 2010, which examined potential health effects of mining and other activities in the Upper Hunter Valley are noteworthy. The study was undertaken in direct response to concerns previously raised by the Singleton Shire Healthy Environment Group. It was based on an analysis of a range of medical data records. In summary the NSW Health (2010b) study found that, when comparing data for the 1998 to 2010 period for the Hunter region with the rest of non-metropolitan NSW:

- there was no evidence for significantly higher rates for any problems managed or medications prescribed or supplied in the Hunter region;
- the rate of management of respiratory problems was lower in the Hunter region;
- rates of management of asthma, sinusitis, tonsilitis and acute otitis media, and bronchodilator and asthma preventative prescription rates were higher in the Hunter region but the differences were not statistically significant;
- rates for depression, anxiety and anti-depressant prescriptions were not higher in the Hunter region; and
- the prescription of the anti-anxiety medications was higher in the Hunter region but this was not statistically significant.

Comparison of data from 1998-2004 with those from 2005-2010 presented a picture consistent with the above, with respiratory chapter problems tending to be higher in the Hunter region.

A statement by Dr Chant on the study findings read "Today's BEACH data report shows that residents in the Upper Hunter should have confidence that in general the rates of illness in people presenting to GPs are similar to the rates in people in comparable areas of NSW. While there appeared to be slightly higher rates of management for asthma and other respiratory problems, the report could not rule out the possibility that these may have been chance findings."

Further it is noted that the report findings are consistent with the NSW Health (2010a) study of health data, which concluded that these data do not establish that these adverse health effects are attributable to air pollution or to any other specific exposure.

The above independent health investigation findings are cited in response to submissions that major health issues are continuing to arise in the area.

### 9.3 Other matters related to health

#### **Submissions – C1.5, C3.2, C21.1, C40.6, C43.13, C43.19, N8.1, N8.7**

One community submission raised concerns about health impacts from additional gases generated by the proposal. As discussed in Section 8.4, an air quality impact assessment was undertaken and no significant impact from gases is expected to occur off-site.

One submission raised the issue of anxiety and depression caused by future uncertainty regarding their jobs and home/ property, associated with mining activities. The Proponent acknowledges these concerns. However, it is noted that the property where the respondent works has been subject to acquisition on request of the landholder since 2003, due to the existing approved HVO North operations, and this will continue to be the case irrespective of the proposal. The landholder has the ability to activate its rights of acquisition upon request. A response to submissions on property values and saleability is provided in Chapter 12.

It was submitted that no health risk assessment was undertaken for the proposal. The EA was undertaken in accordance with the EARs, which did not include any requirement for a health risk assessment. Notwithstanding, the air quality study included assessment of predicted cumulative dust levels against the DECCW (2005) criteria, which reflect the current Australian community standards for the protection of health.

One submission raised compliance with a HVO South consent condition regarding air conditioning. Whilst this is not related to the current proposal for HVO North consent modification, it is noted that liaison continues with this land owner regarding air quality mitigation.

Finally, two submissions raised health and safety of locals and miners. A response to health-related matters has been provided in this chapter. As stated in Section 3.1 of the EA, safety at HVO North is actively managed through the Proponent's HSEQ Management System and the proposal does not involve any change to the existing safety systems.

## 10 Cultural heritage

### 10.1 Assessment approach

#### 10.1.1 Reporting of aboriginal objects

##### **Submissions** - G1.18, G1.19

The DECCW submitted that at least one of the reports used to inform the EA heritage study, uses a site classification which is inconsistent with the following, said to be set by DECCW:

- an isolated find is a 'single object identified within a 50m radius'; and
- an artefact scatter is 'two or more objects identified within a 50m radius'.

The Proponent understands that DECCW does not have an officially sanctioned spatial definition of what constitutes an 'isolated find' or 'artefact scatter'. The DECCW (2010) *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* expressly states that 'DECCW does not have a formal definition of an open artefact scatter, such as 2 artefacts within 50m'. In addition, the earlier NPWS (1997) *Guidelines for Archaeological Survey Reporting* state that '...the Service does not have a formal definition of an open artefact scatter as 2 artefacts within 50m'. The Proponent is satisfied that the definitions that it and its consulting archaeologists use are appropriate.

#### 10.1.2 Aboriginal community consultation

##### **Submission** - G1.22

The DECCW submitted that Aboriginal community consultation undertaken as part of the Cultural Heritage Working Group (CHWG) meetings is not effective in isolation and raised matters that attendees of the CHWG meetings were not always adequately informed of the proposal and demonstrated a 'considerable degree of confusion'.

Details of Aboriginal community consultation undertaken, including meeting minutes and the process used, are included in the Aboriginal cultural heritage study (EA Appendix H) and summarised in Section 5.7 of the EA. The Proponent contends that the Aboriginal community consultation process was comprehensive, transparent, inclusive and complies with all statutory requirements. In addition to six publicly advertised community consultation meetings held between August 2009 and April 2010 where the proposal was discussed, hardcopies of all relevant proposal documents were forwarded to all consultation parties in advance of such meetings.

Discussions included detailed reviews of the nature, outcomes and status of all works that had been undertaken within the project area and identification of areas that had not been investigated. With regards to these remaining areas, the methodology for the conduct of the initial investigations, personnel to be involved, the outcomes of the investigations, and the subsequent management strategy to be put in place were also discussed and agreed within these CHWG meetings.

Hardcopies of meeting presentations were distributed at these meetings, and are included in the cultural heritage study (EA Appendix H). Meeting attendees had ample opportunity to raise any issue(s). In addition, CHWG stakeholders who could not attend CHWG meetings, or who may have wished to provide

further or confidential feedback were invited to do so at any time in writing via email, fax or letter, as is specified in the public notices and letters sent to stakeholders.

The Proponent is not of the view that the consultation documents included in the cultural heritage study (EA Appendix H) demonstrate a 'considerable degree of confusion' by Aboriginal stakeholders.

## 10.2 Cultural heritage management

### 10.2.1 Part 6 NPW Act approvals

#### **Submission - G1.20, G1.23**

The DECCW submitted various concerns that due to assessment of the proposal under Part 3A of the EP&A Act, there would be no requirement to follow the s90 approvals process in accordance with Part 6 of the *National Parks and Wildlife Act 1974* (NPW Act). Concerns raised included that this had not been clearly outlined during the Aboriginal consultation and that any modified consent should include requirements for best practice in cultural heritage management. It was also raised that the consent should enable the registered Aboriginal parties opportunity to engage in the development, implementation and monitoring of Aboriginal cultural heritage through a revisited Aboriginal Cultural Heritage Management Plan (ACHMP) process.

The Proponent has taken detailed legal advice regarding the applicability of the Aboriginal Heritage Impact Permit (AHIP) process under Part 6 of the NPW Act with respect to a Part 3A section 75W approval. Given that DA 450-10-2003 is a Part 4 approval under the EP&A Act, it is considered that the Part 3A - 75U(d) provision granting exemption from the Part 6 AHIP approvals requirement does not apply in this case. That is, the proposed modification under Part 3A does not exempt requirements for an AHIP permit, as established by the Part 4 approval. As such, the requirement for a Part 6 approval under the NPW Act was expressly detailed in all documentation and consultation and is reiterated in Table 2.2 of the EA which states 'section 90 permits will be sought for affected Aboriginal objects, as required'.

The Proponent considers that it has fulfilled all consultation requirements for the proposal. The Aboriginal community was provided the opportunity to participate in the significance assessment, discussion and development of management measures for this proposal.

### 10.2.2 Compliance with consent

#### **Submissions - G1.21, G1.24**

The DECCW raised concerns relating to Conditions 40 and 41 of the existing consent, DA 450-10-2003. These conditions relate to an exclusion zone around CM-CD1 and the Older Stratum and continuation of the Cultural Heritage Investigation Management Agreement (CHIMA) '*which may include consideration of permanent conservation status for the site CM-CD1, and also sites 37-2-1504 (i.e. CM1), part of 37-2-1505 (CM2), 37-2-1522 (CM19), and 37-2-1535 (CM32). Details of any agreement shall be provided to the Director-General within 14 days of any final agreement(s).*' Concerns predominately related to:

- the proposed impacts to/ destruction of sites which were excluded from mining in the existing Development Consent and to which consideration was to be given to permanent conservation status;
- notification has not been given to the Director-General (DoP);
- the only proposed management strategy is to salvage the remaining surface artefacts;

- if conservation and avoidance of this area is no longer a focus of the ACHMP and consent, these need to reflect this change;
- the EA does not provide any evidence of support from Aboriginal stakeholders for this change in management; and
- an additional section of the ACHMP should be drafted to reflect the different planning processes for each portion of the development.

In response it is noted that the consent condition ‘...may include consideration of permanent conservation status...’ does not mean that it must or will be given such status. The terms of the CHIMA provide the Proponent with the option that after 7 August 2005 they are free to apply for a s90 consent to destroy CM-CD1 and the Older Stratum, provided all other development conditions have been satisfied. The Proponent, through the submission of the Carrington West Wing Extension Modification has demonstrated that it is now intending to seek approval for a s90 consent for these sites. Accordingly, the process of modifying the consent to reflect this is being undertaken through the appropriate mechanisms. The agreed provisions of the CHIMA for CM-CD1 (and those portions of sites CM1 and CM2 that are located within the management buffer boundary) were developed on the premise that the site could not be made part of a permanent conservation area and were formally settled on that basis.

The Proponent understands that the requirement for notification to the Director-General (DoP) on any ‘agreement being formalised’ relates specifically to any subsequent agreement with respect to the permanent conservation of the sites cited in Condition 40. As no such agreement has been entered into, then the notification provision has not been triggered.

The Proponent, through consultation with the CHWG, has received endorsement of a management regime that includes the salvage of all these sites as well as a commitment to establish an appropriate offset area for the conservation of cultural heritage, developed in consultation and agreement with the CHWG. The Proponent’s existing cultural heritage management plan which covers HVO North will be amended as required to reflect the proposed cultural heritage management of the proposal. Further discussion is provided in the response below.

### 10.2.3 Proposed management strategy

#### **Submissions – G1.23, G1.24, G1.25, G1.26**

The DECCW noted the cultural significance and rarity of the Aboriginal site CM-CD1 and that the EA indicates the community requires a significant offset for the destruction of the CM-CD1, CM1 and CM2 complex. The DECCW stated that a more appropriate management strategy is required, including a comprehensive program of archaeological salvage of the CM-CD1, CM1 and CM2 complex, and raised concerns about a lack of community support for the proposed management strategy.

Section 7.2 of the cultural heritage study (EA Appendix H) evidences that at the CHWG meeting on 12 February 2010, the Aboriginal community stakeholders agreed in principle to endorse the cultural heritage report and management measures and commitments in the EA, subject to the inclusion of the statement:

*‘The CHWG want to note that the site CM-CD1 [AHIMS 37-2-1877] is very significant to the community and regardless of the offsets being considered in the CNA heritage conservation areas strategic plan, the CHWG desire that a requirement for a heritage offset area for the loss of CM-CD1 be included in the plan of management for the Extension area, because of the high significance of this site, something beyond the existing strategy needs to be determined. The*

*offset area needs to be outside the current mining leases and mining areas, which could be on private property and be land that the community could manage ourselves or some other lands considered appropriate for an offset by the CHWG and CNA.”*

The Proponent has endorsed the CHWG statement and affirmed its commitment for an offset area, as evidenced in Section 7.2 of the cultural heritage study (EA Appendix H). Subsequently, the Proponent has embarked on a consultation and assessment program to identify an appropriate offset area, and this is ongoing.

As stated in Chapter 8 of the Aboriginal cultural heritage study (EA Appendix H), a comprehensive program of archaeological salvage is proposed, which would not be restricted to surface material only, as contended by the DECCW.

In light of the community's endorsement of the management program, the acceptance and support by the Proponent for the Aboriginal stakeholders request for an off-site cultural offset area as an additional management requirement, and the program now in effect to achieve that requirement, the Proponent does not believe that any additional steps need to be taken to secure community endorsement.

#### 10.2.4 Care of Aboriginal objects salvaged

##### **Submission - G1.28**

The DECCW submitted that cultural heritage management of the proposal may result in an 'unmanageable volume of objects' being stored under the interim agreement (Care Agreement #2863), which is now valid until 2013. It was recommended that the care of any Aboriginal heritage objects recovered by the proposal be revisited in consultation with the community, with priority given to long term management. It was further noted that temporary management options need to ensure the stored objects are accessible to the Aboriginal and research community.

Based on the findings of McCardle Cultural Heritage (MCH) (2009) and other assessment reports associated with the project area, which are referenced in Chapter 4 of the Aboriginal cultural heritage study (EA Appendix H), it is considered highly unlikely that a density/ volume of cultural materials would be encountered that would be 'unmanageable'. The Proponent along with other development Proponents, the NSW Minerals Council and the Aboriginal community are currently exploring options for the permanent management of salvaged cultural materials. The approved care and control process under Care Agreement #2863 is specifically designed to manage the storing objects in the interim and allow time to facilitate negotiation regarding long term curation. This process is considered to be more than adequate and no change to it is proposed.

#### 10.2.5 Unrecorded objects

##### **Submission - G1.27**

The DECCW submitted that additional objects may be encountered at depth and under vegetation at the locations of the newly identified sites, HVO-1121 to 1125, as well as under vegetation at other locations, particularly in proximity to CM-CD1, CM1 and CM2.

The Proponent notes that the potential for subsurface material being associated with HVO-1121 to 1125 was expressly considered by MCH (2009). The MCH (2009) report clearly states that there was no prospect of subsurface material being associated with these sites. The Proponent considers that the program of subsurface testing endorsed for CM-CD1, CM1 and CM2 (refer to Chapter 8 of the cultural heritage study, EA Appendix H) will be suitable to deal with any subsurface material encountered.



### 10.3 Conditions of approval

#### ***Submission - G1.29***

The DECCW recommended several conditions of approval to the DoP. These relate to the ACHMP, efforts to avoid impacts to Aboriginal cultural heritage values, the archaeological salvage program, site recording, consultation and an Aboriginal cultural education program. A number of these conditions are not considered to be appropriate in light of the responses provided in the previous sections. Notwithstanding, the Proponent confirms that it will comply with conditions of consent set by the consent authority.

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## 11 Ecology

### 11.1 Assessment approach

#### **Submissions** - C48.9, N6.29, G1.13

The DECCW submitted that it was unable to confirm the adequacy of the ecological survey as details such as the time, date and distance/ area of searches and surveys and the targeted species survey techniques were not provided.

The ecological survey methodology is presented in Chapter 3 and Appendix 5 of the ecology study (EA Appendix I). This includes ecological survey dates and techniques in Sections 3.2, 3.3 and Appendix 5, and a map showing the search/ survey areas in Figure 3. Survey times for the *Diuris tricolor* are provided in Appendix 5.

One community respondent submitted that the cumulative loss of mature remnant endangered ecological communities (EECs) was not adequately assessed. Impacts on the *Central Hunter Grey Box-Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions* EEC were assessed in accordance with the relevant DECCW guidelines, being the DEC & DPI (2005) *Draft Guidelines for Threatened Species Assessment - Part 3A of the EP&A Act* and cumulative impacts across the locality were considered. The assessment is provided in Appendix 4 of the ecology study (EA Appendix I). From a cumulative perspective, the extent of this community remaining regionally (approximately 46,920ha) and locally, within a 5km radius of the study area (approximately 911.6ha), was estimated from available vegetation mapping. The small area of 0.89ha proposed for clearing represents a very small percentage of this community within the region and locality, and does not represent a significant loss on these scales. Further detail on the assessment methodology is provided in the ecology study (EA Appendix I).

One submission stated that a riparian or aquatic habitat assessment is needed for the Unnamed Tributary. This was undertaken as part of the ecology study of the proposal and the methodology and results are presented in the Section 5.8 of the EA and the ecology study (EA Appendix I). In summary, it was found that aquatic environments of the Unnamed Tributary are of low aquatic habitat significance and riparian vegetation is absent or in poor condition. The Unnamed Tributary is characterised by a lack of connectivity, with barriers to fish migration. It was predominately dry and devoid of native vegetation at the time of surveys. No threatened fish species listed under the *Fisheries Management Act 1994* or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been recorded within a 10km radius.

### 11.2 Biodiversity

#### 11.2.1 General matters

#### **Submissions** - C9.7, C28.3, C46.5, C48.7, C62.5, C62.14, N3.6, N5.6, N7.17

Concerns were expressed regarding potential ecological issues, including possible impacts to ecology of the entire Hunter Region. Objections were raised to clearing of native vegetation, which was said to be contrary to the objects of the *Native Vegetation Act 2003* and NSW Government policy. Associated impacts to wildlife habitat were also mentioned.

An ecology impact assessment assessing all potential impacts on local biodiversity was undertaken and the results are provided in Section 5.8 of the EA and the ecology study (EA Appendix I).

In summary, it was found that due to past agricultural activities, a large majority of the project area comprised a modified landscape which harboured little intact native flora and fauna habitat and only small highly fragmented remnants of native vegetation. The remnant vegetation was in moderate to poor condition in terms of flora and fauna habitat value.

Native vegetation removal for the proposal would be minimal, predominantly restricted to a 0.89ha area of woodland and scattered remnant and planted trees. This would be managed in accordance with the procedures nominated in Section 5.8.3 of the EA and Chapter 6 of the ecology study (EA Appendix I), to minimise any potential impacts, including to fauna habitat. Moreover, the proposed rehabilitation strategy includes rehabilitation and reinstatement of the Unnamed Tributary and rehabilitation of more than 50ha of woodland, which would aim to enhance biodiversity values of the area post-mining and mitigate longer term impacts of vegetation removal. The proposed vegetation clearing is subject to approval by the NSW Government and subject to the implementation of the proposed mitigations measures (refer EA Section 5.8.3), the proposed vegetation management is considered to be consistent with the objectives of the *Native Vegetation Act 2003*.

Field surveys identified an isolated occurrence of the threatened Tiger Orchid (*Cymbidium canaliculatum*) adjacent to the operational Carrington Pit. It is proposed to translocate the Tiger Orchid. No other threatened species, populations or communities or migratory species listed under the *Threatened Species Conservation Act 1995* (TSC Act) and/ or the EPBC Act are likely to be significantly impacted by the proposal (refer to the EA Section 5.8.2 and the ecology study, EA Appendix I).

No broader impacts to ecology of the Hunter Region were identified. The surface water study (refer to the EA Section 5.3 and Appendix D) found that the proposed management measures would ensure no measurable adverse impacts on riparian and ecological values of watercourses within or downstream of the project area.

More specific submissions on ecology are addressed in the following sections.

### 11.2.2 Riverine ecology

#### **Submission - C28.2, N1.9, N1.10, N1.11**

It was submitted that the health of river dependent communities could be affected. A submission specifically mentioned that proximity of the extension of the proposed evaporative sink to the endangered River Red Gum (*Eucalyptus camaldulensis*) population, Carrington billabong ecosystem and the Hunter River presented a threat to riverine ecology, citing a breach in a flood as a risk. As mentioned in Chapter 4 of this report, a surface water study of the proposal found that the proposed management measures will ensure no measurable adverse impacts on riparian and ecological values of watercourses on the site and downstream of the proposal (refer Section 3.6 of the surface water study, EA Appendix D). This includes the Carrington billabong and Hunter River. The proposed long term steady state free standing water elevation for the evaporative sink is 40m above the Australian Height Datum, which is consistent with previous design criteria. Numerical modelling confirmed that the nominated free standing water level would ensure that groundwater within the emplaced mine overburden and evaporative sink would remain isolated from the Hunter River alluvial lands south of the barrier walls and no overtopping or fill and spill would occur. The landform between the river and the evaporative sink would prevent floodwaters from entering the evaporative sink.

### 11.2.3 Threatened species

#### i General

##### **Submission - N5.5**

One submission raised that the proposal would contribute to the loss of important habitat for threatened species. Detailed assessment of all potential impacts on threatened species, populations and threatened ecological communities listed under the schedules of the TSC Act and EPBC Act have been provided in Appendix 4 of the ecology study (EA Appendix I) and an overview of the findings is provided in Section 11.2.1 of this report. Comments raised with respect to specific biota are addressed below.

#### ii Powerful Owl

##### **Submission - C48.8**

One community respondent stated that the Powerful Owl (*Ninox strenua*) recording is significant and should not be taken lightly.

A Part 3A impact assessment was undertaken specifically for the Powerful Owl, the results of which are provided in Appendix 4 of the ecology study (refer EA Appendix I). It was found that the proposal is unlikely to have a major impact on this species. This was due to a number of reasons, including the absence of suitable breeding habitat or understorey, both of which are important habitat components for the Powerful Owl; the large home range used by this species (450 to 1,450ha); and the fact that foraging habitat to be impacted equates to only 0.55 per cent of the available habitat resources within the locality (1,454.85ha). It is noted that the pellet identification was inconclusive, being either that of a Powerful Owl or a Barn Owl. There are no other records of Powerful Owls within a 10km radius of the study area and the impact assessment was conducted as a precautionary approach.

#### iii River Red Gums

##### **Submissions - C48.10, N1.9, G1.17**

The DECCW questioned whether the River Red Gum Rehabilitation and Restoration Strategy was additional to I&I NSW requirements. Clarification is provided that the Proponent is implementing this strategy in compliance with current HVO North consent requirements rather than a specific I&I NSW requirement.

Submissions raised potential impacts on the River Red Gum population and the recovery strategy for this population. The proposal does not involve any changes to the River Red Gum Rehabilitation and Restoration Strategy, which will continue to be implemented in accordance with the existing Development Consent. An assessment of potential impacts on this population was undertaken as part of the groundwater and ecology studies and the results are provided in the EA Sections 5.2 and 5.8 and Appendices C and I. In summary it was found that the proposal would not impact groundwater water levels within the alluvium hosting the nearby river red gum populations. An impact assessment in accordance with DEC & DPI (2005) guidelines, which considered the single specimen to be removed by the proposal as well as the presence of populations further afield found that the proposal was highly unlikely to have a significant impact on the River Red Gum population.

### 11.2.4 Micro-organisms

#### **Submission - N1.8**

One NGO submitted that the EA has not recognised micro-organisms that have evolved around the interconnection between groundwater and surface water.

The ecology study provided a general assessment of potential biodiversity impacts, considering aquatic and terrestrial habitats and direct and indirect impacts, along with specific impact assessments for threatened species, populations and ecological communities. While no such aquatic micro-organisms are listed as threatened under State or Commonwealth legislation, impacts on aquatic biota were addressed in the aquatic ecology impact assessment contained in the ecology study (EA Appendix I). Further, the groundwater study (EA Appendix C) addressed groundwater dependent ecosystems, and the surface water study (EA Appendix D) addressed riparian and ecological values of watercourses on site and downstream of the proposal, as per the EARs. The proposed rehabilitation also addresses aquatic habitat considerations, in that the mining disturbed catchments are proposed to be largely reinstated to existing conditions at the end of mine life and the Unnamed Tributary is proposed to be reinstated to its original position, subject of a Management Plan, and including revegetation and monitoring to ensure its ecological health.

## 11.3 Biodiversity management

### 11.3.1 Offsets

#### **Submissions - N5.7, N5.8, G1.14, G1.15**

The DECCW submitted that a biodiversity offset is needed for the Central Hunter Box - Ironbark Woodland EEC and for the Tiger Orchid, should the proposed translocation be unsuccessful. In its submission, DECCW agreed that offsets were not required for the River Red Gum or *Diuris tricolor*. The Hunter Environment Lobby also raised the need for offsets.

Significantly, the Proponent, as part of its broader operations within the Hunter Valley, is currently managing and/ or developing thousands of hectares of biodiversity offsets. However, it considers that a formal biodiversity offset strategy is not warranted for this proposal, given the following considerations, which are set out in the EA Section 5.8 and the ecology study (EA Appendix I):

- the project area and surrounds predominately comprise a completely modified landscape, in poor condition in terms of flora and fauna habitat, with little or no native vegetation;
- the threatened vegetation to be removed is minimal in extent and fragmented, comprising only 0.89ha of Central Hunter Box – Ironbark Woodland (which is in a moderate to poor condition), a single River Red Gum and translocation of a single Tiger Orchid, from the edge of the existing Carrington Pit, where long term viability is currently under threat;
- the ecology study found that the proposal was highly unlikely to have a significant impact on the *Central Hunter Grey Box-Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions* EEC within the region or locality; and
- the proposal includes suitable measures to maintain or improve biodiversity, including translocation of the Tiger Orchid away from the disturbance area and the rehabilitation strategy, which includes reinstatement of the Unnamed Tributary and rehabilitation of more than 50ha of woodland for biodiversity purposes. Further, the Proponent has enhanced the conservation of the

Tiger Orchid by protecting an individual within an offset at Archerfield near HVO South. The Proponent has also proposed offsets for other mines, which contain Tiger Orchids. These are at the Proponent owned Broomfield property near the Mount Pleasant Mine and at the Goulburn River offset proposed for the Warkworth Mine. Although these offsets are not specific for any impact to Tiger Orchid, they will provide long term conservation options for this species.

In acknowledgement of the proposed removal of 0.89ha of Central Hunter Box – Ironbark Woodland, the proposal includes post-mining rehabilitation of a nominal four hectares of this community.

One submission made a statement regarding the integrity of the Proponent’s offsets. This is a general statement rather than being specific to this proposal, and as such, is outside the scope of this report.

### 11.3.2 Rehabilitation

#### ***Submission - G1.16***

The DECCW questioned whether the rehabilitated woodland will aim to re-establish the Central Hunter Box - Ironbark Woodland EEC and if this is additional to, or part of any I&I NSW rehabilitation requirements. The proposed rehabilitation of four hectares of Central Hunter Box – Ironbark Woodland is an initiative of the Proponent. It would be undertaken as part of the broader post-mining rehabilitation program for the proposal, which would be monitored by government agencies, including the I&I NSW, and would be reported in the AEMR. The Central Hunter Box - Ironbark Woodland EEC was assessed to be in moderate to poor condition within the study area, only 0.89ha would be removed and the proposal was unlikely to constitute a significant impact. No specific commitment is made to re-establish the EEC, however, revegetation would be with species that are representative of Central Hunter Box - Ironbark Woodland. The aims would be to provide a net gain in woodland locally, in the medium to long term, and improve habitat for the local biodiversity.

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## 12 Socio-economics

### 12.1 Mining versus other values

**Submissions** - C6.4, C8.3, C10.6, C11.4, C12.4, C14.3, C14.8, C16.1, C17.3, C18.4, C20.4, C22.4, C23.1, C25.4, C25.6, C26.6, C27.11, C27.14, C29.6, C32.1, C31.6, C32.7, C32.8, C32.9, C33.5, C34.11, C36.4, C35.2, C35.3, C37.4, C38.4, C39.3, C41.3, C41.12, C42.8, C42.22, C47.7, C48.12, C49.2, C51.4, C52.3, C54.6, C55.1, C56.6, C60.8, C62.2, C62.7, C62.13, C62.30, N1.22, N1.24, N2.3, N2.4, N2.10, N3.7, N6.1, N6.4, N6.40, N6.41, N6.42, N7.1, N7.2, N7.4, G2.14

The above submissions contended, albeit in a variety of ways, that other values were more important than the mining of coal in the proposed extension area, and/ or that the DoP must carefully consider the net economic benefit of the proposal in the context of social and environmental risks. Examples of this view follow;

- long term society benefits of the healthy river system and productive river flats outweigh those from extracting 17Mt of coal;
- the Hunter River system and associated alluvial flats are a priceless asset for future generations - no right to ruin them for short term financial gain;
- the proposal only has short term benefits and threatens long term natural assets;
- accept that the government will generate a profit share through taxes, however, local residents bear the negative impacts and do not reap direct or indirect financial rewards; and
- community bears the long term burden of social, economic and environmental losses caused by coal mining expansion.

One submission acknowledged the value of the coal industry to the Hunter Valley and NSW.

The EA demonstrates that no significant adverse impacts are anticipated; including long term impacts to the health of the Hunter River system or agricultural suitability (refer Chapters 4 and 5). After the proposed six year life of the proposal, the mining area is proposed to be rehabilitated and as such, economic values associated with agricultural landuses could be restored; no long term impacts of significance are anticipated. The HVO North has already provided s94 contributions to Singleton Council, to be used for local economic benefit and this proposal is not expected to result in any changes to local government services.

The EA, in Chapter 7, sets out the reasons that the proposal is justified. The justification is provided in terms of the proposal being consistent with the relevant objects of the EP&A Act. The main points in the justification case in respect of the matters raised in the submissions are:

- implementation of the proposal will enable the efficient extraction of an economic resource and provide for continued regional and local economic benefits;
- no significant adverse economic, social or environmental impacts are anticipated, subject to the implementation of the mitigation, management and/or monitoring presented in the EA; and
- the benefits of the proposal sufficiently outweigh the costs.

A socio-economic assessment of the proposal was undertaken which considered, amongst other matters, the net economic benefits of the proposal. In Section 5.13.5 of the EA, it is indicated that the net production benefits of the proposal are estimated at a minimum of \$482M and that any residual environmental impacts after mitigation would have to be valued at greater than \$482M to make the proposal questionable from an economic perspective. In its determination of the proposal the DoP should consider net benefit as part of its assessment of ESD principles.

## 12.2 Property values

**Submissions** - C1.4, C4.6, C27.15, C40.5, C57.6, C60.2, C60.5

These submissions expressed concern that the proposal would have a detrimental effect on property values and saleability in the area.

The project area will be restricted to Proponent owned land. The proposed extension is relatively small when compared to mining in the local area and therefore it is not anticipated to impact on property values.

On a regional scale, a study published by the DoP (2005) found that demand for housing has increased in proximity to mine developments in the Upper Hunter Valley. The demand for housing in the Singleton LGA is strong and the median family income is higher than LGAs in the region. These factors together contribute to maintaining property values within the Singleton LGA.

House price growth for the 12 months to March 2010 in the Hunter Valley increased by 14.5 per cent, and the rate of growth for vacant lot prices and number of dwelling approvals for the same period increased by 3.9 per cent and 8 per cent respectively (Hunter Valley Research Foundation, 2010). In addition, information from the NSW Land and Property Management Authority, which tracks regional land values across NSW, displays an increase in land values in the Upper Hunter Valley, where values were \$85,000 in 2009 compared to \$39,000 in 1996 (an increase of 46 per cent over 10 years).

## 12.3 Incomes and costs

**Submissions** - C1.3, C27.5, C27.6, C27.12, C60.9, G2.12, G2.13

Incomes and costs were raised in several submissions. Specific comments include:

- concerned about future farm income and the farm's profitability due to the encroaching mining presence, and the impact this will have on their planned retirement income;
- if affected businesses are unable to continue, this could have a cumulative negative impact on other local business used as suppliers;
- no specific commitment is made in relation to community benefits other than those derived from economic benefits;
- wants an ongoing monetary trust fund set up for the township of Jerrys Plains if the proposal is approved to compensate for the negative impacts; and
- the DoP should establish a mechanism to facilitate a community enhancement offset in respect of the village of Jerrys Plains.

The project area is located on lands owned by the Proponent. Implementation of the proposal should not affect the ongoing operation of any farming enterprises or other businesses outside of the existing HVO zone of affectation. Activities on these properties could proceed as they do currently, subject to the implementation of the mitigation, management and/or monitoring presented in the EA. The proposal is not predicted to result in the inclusion of any additional properties in the HVO zone of affectation. Response in the context of property values is provided above in Section 12.2.

The proposal does not involve any change to employee numbers and accordingly will not have any additional impact on infrastructure at Jerrys Plains. A suite of mitigation measures are included in the EA to minimise the potential for adverse impacts on the surrounding community, including Jerrys Plains, and the EA has shown that the proposal would not result in any significant adverse impacts. Accordingly, no additional community enhancements are considered warranted, beyond the Proponent's existing community relations programme. This programme includes a Community Development Fund, through which funding is provided to Hunter Valley community projects and programmes, in the areas of business development, education, health, agriculture and environment.

One submission disagreed with 'local' economic benefits presented in the EA, as only a small percentage of employees live locally. The economic impacts of the proposal, as presented in the EA, were calculated for the Upper Hunter region, comprising the local area as well as the broader surrounding region.

## 12.4 Lifestyle impacts

**Submissions** - C27.7, C34.7, C50.2, C50.3, C50.4, C50.21, C60.2, N6.3

Potential impacts of the proposal on lifestyle were raised in several submissions. Comments included the following.

- the peaceful tranquil lifestyle once enjoyed is diminishing;
- the proposal conflicts with the quiet rural setting and 'life on the farm';
- the proposal is the closest and most intrusive of the mining projects to date and will adversely impact the amenity of their neighbouring property so they will be unable to continue to own and operate the farm, which has been in the family since 1930; and
- concerned about the cumulative effects of mining on local communities - more smaller communities will vanish.

The proposal is an extension of an existing pit on lands owned by the Proponent, consistent with the surrounding mining activities, and is not anticipated to have any significant adverse economic, social or environmental impacts. Further response in the context of air quality, noise and vibration is provided in Chapters 7 and 8 of this report. Lifestyle-related impacts are projected to be minimal and would be relatively short-lived, as the life of mining in the proposed extension area is proposed to be six years. Additionally, the mine will be progressively rehabilitated, returning it to its previous rural setting.

In respect of the third dot point, the EA acknowledge the predicted impacts on this property, which is in the current zone of affectation for HVO. The Proponent continues to liaise with the landholder regarding the impacts to this property.

## 12.5 Employment

### **Submissions – C1.2, C2.1, C27.13**

The following matters relating to jobs were raised in these submissions:

- concern about loss of jobs at a property adjacent to the proposed extension area;
- concerned about impacts of the proposal on himself and his family, who live and work on a property adjacent to the proposed extension area. Believes that it will be impossible to live and operate the business safely, due to proximity to the proposed extension area; and
- employee numbers at HVO will not increase due to the proposal.

Regarding the concern about loss of jobs at an adjacent property, the EA did not conclude that any farming jobs would be lost. The adjacent property does not form part of the proposed extension area however has been in HVO North's zone of affectation for a number of years, and this will continue to be the case irrespective of the proposal. Jobs at the adjacent property are a matter for the landowner. The proponent has been liaising with the property owner on options available for mitigation and compensation.

In regards to employee numbers at HVO, the EA did not indicate that employee numbers would increase at HVO as a result of the proposal. Rather it was contended that the proposal would enhance security of employment at HVO, by having an approved mining project ready to commence operations, using existing HVO staff. The number of people who work at the Carrington Pit is flexible and depends on the workforce requirements of the pit at any given time.

## 12.6 Housing and infrastructure

### **Submissions - C27.14, C60.8, C60.11**

A submission raised the matter that there was no improved housing or infrastructure in Jerrys Plains. The proposal does not involve any change to employee numbers and accordingly will not have any additional impact to housing availability or infrastructure at Jerrys Plains and no amelioration measures are considered warranted in this respect.

A submission requested that a house on the property corresponding to Receptor 10 in the EA be protected through a maintenance plan. While maintenance of this house is the responsibility of the landowner, the property has zone of affectation rights under the existing Development Consent, which are expected to continue with the modification.

It was raised that Jerrys Plains was not included on the regional setting map. This was due to the fact that this map featured towns with significantly larger populations than Jerrys Plains and was intended to provide a regional picture as distinct from a local one. Jerrys Plains, however, is featured prominently in the local setting map.

## 13 Other Matters

### 13.1 Cumulative impacts

**Submissions** - C3.3, C7.2, C14.6, C14.7, C16.6, C17.1, C17.3, C24.1, C25.6, C26.5, C26.6, C31.6, C32.1, C32.2, C32.8, C34.7, C35.1, C35.2, C35.5, C36.6, C39.1, C39.3, C41.11, C42.4, C42.22, C44.8, C45.12, C47.3, C48.13, C49.12, C49.13, C50.17, C50.20, C52.4, C53.1, C53.4, C54.2, C55.2, C55.3, C56.4, C56.5, C61.3, C62.19, C62.20, N1.24, N2.9, N3.1, N3.6, N5.2, N5.16, N6.3, N6.8, N6.9, N6.10, N7.11, N7.13, N8.10, N9.4, N9.17, N9.19, N9.20

Several submissions referred to the cumulative impacts of a particular environmental aspect, e.g. dust. Such submissions have been dealt with under the relevant heading for the particular aspect. For example, a response to the cumulative impacts of dust is provided in Chapter 8 Air quality. However, a number of submissions raised matters of the cumulative impacts of mining in a more general sense. Points made in these submissions include:

- the Hunter is over mined;
- the cumulative impact is out of control, especially at Jerrys Plains;
- the EA provides inadequate assessment of cumulative impacts at appropriate scales;
- the EA does not adequately consider issues of regional scale, such as visual and biodiversity;
- discrepancies between different stakeholders as to what level of impact is acceptable and how to best manage them;
- a moratorium should be in place on open cut mining in the region until the Strategic Review of Coal Mining in the Hunter is completed and thoroughly reviewed and the full cumulative effects assessed; and
- there should be no further mine approvals in the Hunter until the cabinet committee announced by the premier to develop a whole of government approach to mining has reported.

As indicated previously, the EA included assessment of cumulative impacts of the proposal. The EA concluded that no significant adverse impacts are anticipated from the implementation of the proposal. This overall conclusion takes account of cumulative impacts. It is considered that the EA assessed each of the potential impacts at appropriate scales. For each environmental aspect, the EA focussed on the potentially affected areas and receptors, and the assessment 'scales' varied accordingly. For example, the visual assessment was localised, focussing on areas from where the proposal was likely to be visible, whilst the potential effects of GHG emissions were considered at State, National and global levels.

With respect to the level or intensity of mining in the region, this is a matter beyond the scope of this report.

Environmental impacts of the proposal and mining were raised in a general sense, along with the need to consider environmental and social impacts. An EA of the proposal was undertaken in accordance with the EARs, which addressed each of the relevant environmental and social attributes. This included application of relevant assessment methodologies and impact assessment guidelines for NSW, as prescribed by government. A suite of mitigation, management and monitoring measures were included in the statement of commitments for the proposal. It was concluded that *subject to the implementation of*

*these measures*, no significant adverse economic, social or environmental impacts are anticipated. Notwithstanding, the acceptability of impacts is assessed by government authorities.

Calls were made for a moratorium on coal mining and coal fired power plants and for the DoP to develop a comprehensive landuse plan for the Hunter coalfields and revisit its 'Cumulative Impact Study'. These are matters for consideration by the regulatory authorities and are beyond the scope of the EARs and the Proponent's application to modify the existing Development Consent.

## 13.2 Visual amenity

**Submissions** – C4.5, C14.6, C14.7, C46.1, C50.16, C50.18, G2.8

Two matters were raised in regards to visual amenity, being the potential for bright lights from mining operations to adversely affect sleep and visual amenity impacts from the implementation of the proposal, including cumulative impacts.

Potential visual impacts, including affects from lighting, are addressed in Section 5.9.2 of the EA. The EA acknowledges that lighting within the proposed extension area may be visible outside the area to some sensitive viewer locations. However, lighting is essential for the safe operation of the mine at night time, is an existing feature of the landscape and the EA concluded that lighting from the proposal would not have a significant additional impact. The Proponent will continue to implement its existing HSEQ Management procedures for lighting. Lighting will be directed away from sensitive residences and roads. Lighting instalments will be designed and placed to minimise lighting impacts wherever possible, including the provision of shields on floodlights. All lighting will comply with AS 4282 – 1997 *Control of the obtrusive effects of outdoor lighting*. In response to Singleton Council's submission on lighting management, it is clarified that these procedures are considered suitable for minimising light spill and glare when viewed from external vantage points.

The visual impact assessment carried out for the proposal found that visual impacts would largely be restricted to drivers along a section of Lemington Road and an adjacent landholder. However, the EA concluded that the extended mining area will be similar in appearance to the mining areas currently visible from these locations. Rehabilitation will restore the visual character of the area and hence visual impacts will be temporary and are not expected to be significant. The Proponent continues to liaise with the impacted adjacent landholder with regard to the impacts of HVO at this property.

## 13.3 Greenhouse gas emissions

**Submissions** - C13.5, C24.1, C32.5, C48.11, C53.3, N1.25, N5.17, G1.6

Submissions were made in relation to GHGs from the proposal and coal mining in general, and associated implications for global warming and climate change. It was submitted that the proposed GHG emissions over the life of the operation are unacceptable and contrary to government policy to reduce emissions. The adequacy of approach to the assessment of GHGs was also raised.

A quantitative GHG assessment of the proposal was undertaken by PAE Holmes, in accordance with the EARs. The methodology and results are provided in Chapter 8 of the air quality study (EA Appendix G) and an overview is provided in the body of the EA (Section 5.10). The DECCW submission confirmed that GHG emissions were estimated using an appropriate methodology.

In summary, it was found that GHG emissions from the proposal were unlikely to have any measurable environmental effect. The Proponent has targets for GHG emissions and energy use, as well as legal requirements for monitoring and reporting on these. The Proponent also has existing energy saving and

GHG emission reduction measures and projects in place, which will continue to be implemented at HVO, inclusive of the proposal. These will be revised as required to respond to new information, technologies and policies as they evolve. The proposed GHG emissions would have to be deemed acceptable by government for the proposal to proceed.

## 13.4 Traffic and transport

**Submissions** - C3.8, C40.1, C50.19, C60.10, G2.11

Several submissions raised matters related to traffic and transport. Matters comprised:

- increased traffic due to the proposal and associated road safety issues;
- traffic volumes, speeds and individual loads have greatly increased due to mining expansions, which poses a safety risk to persons and livestock using the road and its verges;
- the need to upgrade the Golden Highway and Lemington Road intersection in a timely manner;
- safety concerns in respect of the Gouldsville Road/ Golden Highway intersection; and
- safety concerns and call for upgrade of a turnoff from the Highway into a private property.

As stated in Section 5.11 of the EA, there will be no increase to existing traffic volumes on road or rail networks as a result of the proposal, given that it does not involve any changes to employee numbers or coal production, or any haulage on public roads. It is acknowledged that existing traffic volumes associated with HVO will be maintained.

Upgrade of the Golden Highway and Lemington Road intersection is an existing consent condition and will be undertaken separate to this proposal, to the satisfaction of the Roads and Traffic Authority (RTA).

The Gouldsville Road/ Golden Highway intersection and the turnoff from the Highway into a private property are more than 13km south-east of the proposed extension area 'as the crow flies'. The proposal will not result in any change to traffic volumes on public roads, including the Golden Highway, and accordingly does not warrant any upgrades to intersections.

## 13.5 Community consultation

**Submissions** - C2.2, C60.1, C60.7, C60.21

Two submissions related to the approach to community consultation for the proposal. One submission contended that there had been a lack of communication from key personnel regarding the proposed extension area. The other stated that there had been a lack of community consultation, objected to the one-on-one approach which segregates the community and only notifying of meetings in newspapers rather than directly contacting property owners in the vicinity of the proposed extension area.

The EA, in Chapter 4, sets out the consultation which has taken place with the community in respect of the proposal. The proposal was outlined in community newsletters (September and December 2009, and March, June and November 2010), discussed at Community Information Sessions (December 2009) which were advertised in local newspapers and advised by phone to the Community Consultative Committee (CCC) members and elected councillors, and was discussed at CCC meetings throughout 2009 and 2010. In addition, briefing sessions in relation to the proposal were held for HVO CCC members in June and October 2010. Information was on display at the Singleton shopfront and on the Proponent's website

throughout 2009 and 2010. Offers were made at the sessions, in the newsletters and at the shopfront for meetings and follow up information if a member(s) of the community wished to have one. A number of members of the community took up this offer. It is contended that the level of community consultation was appropriate and that any member of the community who wanted individual meetings to further explore/discuss their concerns had opportunity to do so. The location and extent of the proposed extension area have been clearly identified in community consultation material.

One respondent raised that on-going project changes occur with limited consultation. This submission requested the Proponent's full plan for the area and that, if changes are required to the EA, the Proponent's response be placed on public display and a public submission period re-opened. Future plans evolve in response to many variables such as market conditions, mining technologies and resource investigations. Any future modifications would be subject to the applicable government approvals process at the time, with consultation undertaken accordingly. Public submission processes are regulated by the DoP and are beyond the scope of this report. The Proponent will continue to provide community updates on the proposal through its established communication channels, including its shopfront in the main street of Singleton, newsletter, website and CCC meetings.

### 13.6 General legislation and policy

**Submissions** - C23.3, C43.14, C56.7, C60.6, N5.4, N9.20

These submissions related generally to legislation, including compliance with the Singleton Local Environmental Plan 1996 (LEP), adequacy of laws and the regulatory system and the need for a new approach to protection and sustainability of land and water.

The submission relating to the Singleton LEP contended that the proposal does not comply with Clause 10b of the LEP or Clause 2(g), which seeks to encourage adoption of land management practices which are sustainable over long periods of time without degradation of natural environmental systems.

Section 2.4.2 of the EA discusses the application of the above LEP to the proposal. It concludes that the proposal is a permissible development under the relevant zoning, namely Rural 1(a), and that the proposed modification is generally consistent with the objectives of the zone.

The adequacy of laws and the regulatory system is a matter for government administration and is outside of the scope this report.

One submission raised that the criteria for environmental impacts are set too low. The EA used the applicable impact assessment criteria for NSW, as set by the relevant government bodies.

### 13.7 Alternatives

**Submissions** - C3.7, C35.3, C53.2, N5.3

One submission stated that the mine should be underground rather than open cut, to save the environment. Another submission contended that the EA does not adequately analyse feasible alternatives.

Alternatives are canvassed in Section 3.3 of the EA. Underground mining was not addressed in this section as a feasible or economically viable alternative, given the coal is relatively shallow and not amenable to efficient recovery by underground methods.



Two submissions referenced alternate forms of energy to coal. This is a broader issue beyond the scope of the EA, however there is currently a high demand for coal as an energy source.

### 13.8 ESD considerations

**Submissions** – C56.4, C61.3, C62.12, N6.41, N6.43, N5.3

One submission contended that the EA does not adequately assess the proposal in accordance with ESD principles. Other submissions raised sustainability of the proposal and coal mining in general.

The application of ESD principles is discussed in Section 7.2 of the EA. The EA has been subjected to an adequacy review by the DoP and deemed adequate to proceed to public exhibition.

### 13.9 Acquisition

**Submissions** – C50.1, C50.5, G2.5

A landholder whose property is within the zone of affectation and subject to acquisition on request expressed concern that, if acquired, the price would be significantly reduced due to earlier and adjoining mining developments. Singleton Council's submission stated that the right to acquisition upon request should be retained by the landholder. In accordance with condition 1 of Schedule 4 of the existing Development Consent DA 450-10-2003, the landowner of the property where Receptor 10 is located presently retains the right to acquisition on request and this will continue with the modification. In accordance with conditions 9 to 11 of Schedule 5 of DA 450-10-2003, within six months of the landowner making a written request to the Proponent, the Proponent is required to pay the landowner:

- current market value of the landowner's interest in the land as if the land was unaffected by coal mining and related activities at HVO, including existing and permissible land use and improvements;
- reasonable costs associated with relocation and advice associated with the acquisition; and
- reasonable compensation for disturbance cause by the acquisition.

The Proponent continues to liaise with the landowner with regard to the impacts of HVO at this property.

### 13.10 Waste

**Submission** – G1.30

As stated in the EA Section 3.1iv, the proposal does not involve any changes to waste streams or waste management plans or procedures from those assessed and approved as part of the ERM (2003) EIS. Accordingly, the waste management component of the EA focussed on the proposed overburden emplacement areas and identification of waste management procedures which contribute to the energy efficiency of HVO (refer EA Section 5.10.3). Further details of the HVO waste streams and waste management procedures are provided in the ERM (2003) EIS. The EA has been subjected to an adequacy review by the DoP and deemed adequate to proceed to public exhibition.

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## 14 Conclusions

This report provides a response to the submissions received from the exhibition of the EA of the proposed extension of the existing approved Carrington Pit, to enable the extraction of approximately 17Mt of in-situ coal.

A total of 74 submissions were received: 61 from community members; 10 from NGOs; and three from government agencies. All of the submissions were analysed in terms of the matters they raised and a response is provided in this report. The issues raised most frequently related to groundwater, surface water, soils and agriculture, rehabilitation, noise and vibration, air quality, health, cultural heritage, ecology and socio-economics.

The considered responses to these matters, as well as all other matters raised in the submissions, have led to the conclusion that no changes to the proposal, as outlined in the EA, are warranted and that the conclusions in the EA remain valid.

Following analysis and consideration of all submissions received, the Proponent considers that the proposal is still justified and in the public interest, as:

- the implementation of the proposal will enable the efficient extraction of an economic resource and provide for continued regional and local economic benefits;
- no significant adverse economic, social or environmental impacts are anticipated, subject to the implementation of the mitigation, management and/or monitoring presented in the EA; and
- the benefits of the proposal sufficiently outweigh the costs.

The net production benefits of the proposal are estimated at a minimum of \$482M. Any residual environmental impacts after mitigation would have to be valued at greater than \$482M to make the proposal questionable from an economic perspective.

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## Acronyms

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$\mu\text{g}/\text{m}^3$	micrograms per cubic metre
$\mu\text{S}/\text{cm}$	micro Siemens per centimetre
ACHMP	Aboriginal Cultural Heritage Management Plan
ADWG	Australian Drinking Water Guidelines
AEMR	Annual Environmental Management Report
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ARI	average recurrence interval
CCC	Community Consultative Committee
CHIMA	Cultural Heritage Investigation Management Agreement
CHWG	Cultural Heritage Working Group
cm	centimetre
dB(A)	decibels (A weighted scale)
DEC	NSW Department of Environment and Conservation (now DECCW)
DECCW	NSW Department of Environment, Climate Change and Water
DoP	NSW Department of Planning
DPI	NSW Department of Primary Industries (now I&I NSW)
EA	Environmental Assessment
EARs	Environmental Assessment Requirements
EC	electrical conductivity
EEC	endangered ecological community
EIS	Environmental Impact Statement
EMM	EMGA Mitchell McLennan Pty Limited
ENM	Environmental Noise Model
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ESD	ecologically sustainable development
GHG	greenhouse gas
ha	hectares
HNEAS	Hunter New England Area Health service
HRSTS	Hunter River Salinity Trading Scheme
HSEQ	health, safety, environment and quality
HVO	Hunter Valley Operations
I&I NSW	NSW Industry & Investment
INP	Industrial Noise Policy
km	kilometres
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres

## Acronyms (Cont'd)

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m <sup>3</sup>	cubic metres
MCH	McCardle Cultural Heritage
MER	Mackie Environmental Research
ML	mega Litres
mm/s	millimeters per second
Mt	million tonnes
MTW	Mount Thorley Warkworth
NEPM	National Environment Protection (Ambient Air Quality) Measure
NGO	non-government organisation
NOW	NSW Office of Water
NPW Act	NSW <i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
PM <sub>10</sub>	particle matter with equivalent aerodynamic diameters of 10µm or less
PM <sub>2.5</sub>	particle matter with equivalent aerodynamic diameters of 2.5µm or less
ppv	peak particle velocity
RTA	Roads and Traffic Authority
TSC Act	NSW <i>Threatened Species Conservation Act 1995</i>
TSP	total suspended particulates
WM Act	NSW <i>Water Management Act 2000</i>
WSP	Water Sharing Plan

## References

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DEC & DPI (2005) **Draft Guidelines for Threatened Species Assessment - Part 3A of the Environmental Planning and Assessment Act 1979.**

DECCW (2000) **NSW Industrial Noise Policy.** DECCW, Sydney.

DECCW (2005) **Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.** DECCW, Sydney.

DECCW (2010) **Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.** DECCW, Sydney.

DoP (2005) **Coal Mining Potential in the Upper Hunter Valley – Strategic Assessment.** DoP.

ERM (2003) **Hunter Valley Operations West Pit Extension and Minor Modifications Environmental Impact Statement.** Prepared for Coal & Allied.

Fleming K, Hessel E F and Van den Weghe H F A (2008) “Generation of Airbourne Particles from Different Bedding Materials Used for Horse Keeping”, *Journal of Equine Veterinary Science* Vol 28, No 7.

Hunter Valley Research Foundation (2010) **Upper Hunter Region Economic Indicators – June 2010.** Available online at: <http://www.hvrf.com.au/download-publications/economic-indicators>. Accessed 30 November 2010.

Lucas S A, Coombes P J, Planner J and Welchman S (2009) “Rainfall harvesting and coal dust: the potential health impacts of trace elements in coal dust in rainwater”, *Air Quality and Climate Change* Vol. 43 No. 2.

McCardle Cultural Heritage Pty Ltd (2009) **Carrington West Extension Study Area Indigenous Archaeological Assessment.**

National Health and Medical Research Council and the Natural Resource Management Ministerial Council (2004) **Australian Drinking Water Guidelines.**

Noller B (2009) **Community Lead Issues at Camberwell NSW** Centre for Mined Land Rehabilitation, The University of Queensland. Prepared on behalf of Ashton Coal Pty Ltd, Integra Coal Operations and BHP Billiton Energy Coal Pty Ltd.

NOW (2005) **Management of Stream/Aquifer Systems in Coal Mining Developments – Hunter Region.**

NPWS (1997) **Guidelines for Archaeological Survey Reporting.**

NSW Health (2007) **Rainwater Tanks.** Available online at: [http://www.health.nsw.gov.au/pubs/2007/pdf/rainwater\\_tanks.pdf](http://www.health.nsw.gov.au/pubs/2007/pdf/rainwater_tanks.pdf). Accessed 9 December 2010.

NSW Health (2008) **Private Water Supply Guidelines.** Available online at: <http://www.health.nsw.gov.au/resources/publichealth/environment/water/pdf/pwsg.pdf>. Accessed 9 December 2010.

NSW Health (2010a) **Respiratory and cardiovascular diseases and cancer among residents in the Hunter New England Area Health Service.** NSW Department of Health, North Sydney.

NSW Health (2010b) **Analysis of BEACH general practitioner encounter data to examine the potential health effects of the mining industry and other exposures in Singleton, Muswellbrook and Denman.** Available online at: [http://www.health.nsw.gov.au/pubs/2010/beach\\_report.html](http://www.health.nsw.gov.au/pubs/2010/beach_report.html). Accessed 9 December 2010.

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## Appendix A

### Community submissions

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**Table A.1 Summary of community submissions and responses**

Respondent		Issue			Addressed
1	Carmody, Mark and Catherine	<b>C1.1</b>	Air quality	Increased dust impact.	S8.2
		<b>C1.2</b>	Socio-economic	Concerned about loss of jobs as they both work for the Heroic Pastoral Company, which is known to be part of the extension plan.	S12.5
		<b>C1.3</b>	Socio-economic	Concerned about future farm income/ profitability, and accordingly their planned retirement income, due to the encroaching mining presence.	S12.3
		<b>C1.4</b>	Socio-economic	Property devaluation due to the nearby and encroaching mining presence. Concern that the property will not be able to be sold at its true value, and the mining presence has put them at risk of having a non-saleable property in an undesirable area.	S12.2
		<b>C1.5</b>	Health	Health impacts from living in a mining area, including sinus problems and depression and anxiety caused by future uncertainty regarding their jobs and home/ property.	S9.1.1, 9.3
		<b>C1.6</b>	Noise and vibration	Noise and blasting impacts. There are a growing number of cracks in their house.	S7.2, 7.5.1
2	McKay, Glenn	<b>C2.1</b>	Socio-economic	Concerned about impacts of the proposal on he and his family, who live and work on a property adjacent to the proposed extension area. Believes that it will be impossible to live and operate the business safely, due to proximity to the proposed extension area.	S12.5
		<b>C2.2</b>	Consultation/ communication	Lack of communication from key personnel regarding the proposed extension area.	S13.5
3	Hunter, Craig	<b>C3.1</b>	Air quality	Believes that dust and poisonous gases from current mining are not controlled adequately and is concerned about the potential for additional dust and gas pollution.	S8.2, 8.3, 8.4
		<b>C3.2</b>	Air quality/health	Health impacts (from additional dust and gases from the proposal).	S9.1.1, S9.3
		<b>C3.3</b>	Cumulative	Environmental destruction from mining.	S13.1
		<b>C3.4</b>	Noise and vibration	Night time noise impact (currently unbearable at times).	S7.2, 7.3
		<b>C3.5</b>	Noise and vibration	Blasting impacts on livestock and property, which are currently occurring and will be worsened by the proposal.	S7.5.1
		<b>C3.6</b>	Rehabilitation	Believes rehabilitation is insufficient and further mining should not be allowed until more rehabilitation is undertaken.	C6.2
		<b>C3.7</b>	Alternatives	Believes that the mine should go underground to save the environment.	S13.7

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
4	Names removed		
	<b>C3.8</b> Traffic and transport	Turning lane is required into his property from the Highway, prior to the extension, to avoid road safety issues and accidents and cope with the additional 150 cars on the road due to the proposal. States that Coal & Allied employees are currently passing them illegally on the left side at 100km/hour as they try to turn into their property.	S13.4
	<b>C4.1</b> Health/ air quality	Health impacts from dust. Currently suffering allergies and sinus.	S9.1.1
	<b>C4.2</b> Air quality/ water/ health	Black mining dust in gutters. Rely on tank water and the filtration being used in the tanks is expensive.	S9.1.2
	<b>C4.3</b> Noise and vibration	See C1.6. Concerned cracking of their house will increase.	S7.2, 7.5.1
	<b>C4.4</b> Noise and vibration	See C3.4 (sleep disturbance).	S7.2, 7.3
	<b>C4.5</b> Visual	Lighting impacts, which are currently an issue	S13.2
5	Moore, Ian		
	<b>C4.6</b> Socio-economic	Property devaluation. Currently trying to sell their property due to noise and dust, and concerned that with the proposed extension they will never be able to sell.	S12.2
	<b>C5.1</b> Agriculture	Objects to loss/ mining of top quality agricultural land.	S5.1
	<b>C5.2</b> Water	Concerned about impacts on the Hunter River system. This includes irreversible contamination from mine water.	S3.3, 4.2, 4.2.3
	<b>C5.3</b> Water	Concerned about upstream flooding impacts and downstream erosion (from increased flood velocities) caused by the levees.	S4.2.4i
	<b>C5.4</b> Water	Impact on underground aquifers, which are already depleted by the mines and are crucial to survival of surrounding landowners. Irreversible contamination when mixed with mine water. No guarantee that water from the Hunter River and aquifers will not end up in the CWW extension and be contaminated.	S3.2, 3.3, 3.4
	<b>C5.5</b> Noise and vibration	Increased noise at Jerrys Plains and surrounds - already an issue at Jerrys Plains and further afield at Apple Tree Flat.	S7.2
	<b>C5.6</b> Air quality	See C1.1 (at Jerrys Plains and surrounds - cumulative impact is out of control).	S8.2
	<b>C5.7</b> Health/ air quality	See C4.1. Major health issues are continuing to arise; Newcastle Herald article reported that coal dust can harm human health even when within guideline limits.	S9.1.1, 9.2
	<b>C5.8</b> Rehabilitation	The land cannot be rehabilitated back to its current state, as stated in the EA.	S6.1
<b>C5.9</b> Rehabilitation	Disputes the crop yields and quality reported for the Alluvial Lands and expresses concern that he and the	S6.2	

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
		biggest lucerne grower in the area were not contacted for crop comparisons. Also states that investment to achieve this crop was astronomical and is unfeasible for a normal farmer.
6	Skates, Susanne	<b>C6.1</b> Water The proposal contravenes the draft guidelines ' <i>Management of Stream/ Aquifer Systems in Coal Mining Developments 2005</i> ' which give alluvial aquifers a 150m buffer from mining activities.
		S3.6
	<b>C6.2</b> Agriculture Concerned about the cumulative loss of Class 1 and 2 agricultural land in the Hunter Valley.	S5.1
	<b>C6.3</b> Water The proposal will destroy the alluvial aquifer and remove base flows from the river.	S3.2, 3.4, 4.2.1
	<b>C6.4</b> Socio-economic Long term society benefits of the healthy river system and productive river flats outweigh those from extracting 17Mt of coal.	S12.1
	<b>C6.5</b> Precedent/ water/ agriculture If approved, the proposal will set a precedent threatening the rest of the Hunter alluvium.	S3.2, 5.2
7	Damme, Bettina	<b>C7.1</b> Water Objects to mining within 200m of the Hunter River.
		S3.6, 4.2
	<b>C7.2</b> Cumulative Cumulative environmental impacts of mining.	S13.1
8	Blackwell, Doug	<b>C8.1</b> Water See C6.1. The alluvial aquifers are a fundamental part of a healthy and agriculturally productive river system.
		S3.2, 3.6
	<b>C8.2</b> Precedent/ water/ agriculture See C6.5. Believes this proposal will set a precedent for the Hunter River and all river systems in the state.	S3.2, 5.2
	<b>C8.3</b> Socio-economic See C6.4	S12.1
9	Green, Cate	<b>C9.1</b> Water Concerned about mining so close to the Hunter River. The Hunter Valley river systems are already threatened.
		S4.2, 4.6
	<b>C9.2</b> Water See C6.1	S3.6
	<b>C9.3</b> Agriculture See C6.2	S5.1
	<b>C9.4</b> Water See C6.3	S3.2, 3.4, 4.2.1
	<b>C9.5</b> Precedent/ water/ agriculture See C6.5	S3.2, 5.2
	<b>C9.6</b> General Mine employees should consider the consequences of their decisions.	Noted
	<b>C9.7</b> Ecology Mining should not occur in ecologically sensitive and important areas.	S11.2.1
10	Munro, Sharyn	<b>C10.1</b> Water Impacts on water resources - water is more precious than coal.
		S3.2, 3.3, 3.4, 3.8, 4.2

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
11 See, Helene	<b>C10.2</b> Cumulative/ Water	Concerned about threat to the Hunter River/ water sources. The Hunter River has been impacted cumulatively over the last 200 years and should not be endangered further by this proposal.	S4.2, 4.6
	<b>C10.3</b> Water	See C6.3	S3.2, 3.4, 4.2.1
	<b>C10.4</b> Water	See C6.1	S3.6
	<b>C10.5</b> Agriculture	Raised issue of food production/ security.	S5.3
	<b>C10.6</b> Socio-economic	See C6.4	S12.1
	<b>C10.7</b> Agriculture	See C6.2	S5.1
	<b>C10.8</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
	12 Cooper, Susan	<b>C11.1</b> Water	See C6.1
<b>C11.2</b> Agriculture		See C6.2	S5.1,
<b>C11.3</b> Water		See C6.3	S3.2, 3.4, 4.2.1
<b>C11.4</b> Socio-economic		See C6.4	S12.1
<b>C11.5</b> Precedent/ water/ agriculture		See C6.5	S3.2, 5.2
13 Wales, Wendy	<b>C12.1</b> Water	See C6.1	S3.6
	<b>C12.2</b> Agriculture/ socio-economic	See C5.1. Believes the land will be useless for future generations, for goal of short-term profit.	S5.1, 6.1
	<b>C12.3</b> Water	See C6.3	S3.2, 3.4, 4.2.1
	<b>C12.4</b> Socio-economic	See C6.4	S12.1
	<b>C12.5</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
13 Wales, Wendy	<b>C13.1</b> Water	See C6.1	S3.6
	<b>C13.2</b> Water	See C6.3. Concerned about permanent interference and reduction of flows into the Hunter River.	S3.2, 3.4, 4.2, 4.2.1
	<b>C13.3</b> Agriculture	Calls for protection of fertile Hunter alluvium.	S5.1
	<b>C13.4</b> Agriculture	See C10.5	S5.3

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
14 Seldon, Kylie	<b>C13.5</b> Greenhouse gas	Objects on the grounds of exacerbation of global warming caused by the unprecedented rate of Australian coal mining. S13.3
	<b>C14.1</b> Water	See C6.3. Believes the proposal would have devastating effects on the river. A healthy river system is vital to prevent the loss of Class 1 and Class 2 agricultural land in the Hunter Valley. S3.2, 3.4, 4.2, 4.2.1
	<b>C14.2</b> Agriculture	Believes the proposal would have devastating effects on the productive river flats and local agriculture. S5.1
	<b>C14.3</b> Socio-economic	See C6.4 S12.1
	<b>C14.4</b> Water	See C6.1 S3.6
	<b>C14.5</b> Precedent/ water/ agriculture	See C6.5 S3.2, 5.2
	<b>C14.6</b> Cumulative/ visual	See C7.2. Finds it distressing to see the wasteland that mining creates. S13.1, 13.2
	<b>C14.7</b> Cumulative/ general environmental/visual	Believes the proposal will further damage the beautiful area and negatively impact the environment. S13.1, 13.2
15 Cross, Hugh	<b>C14.8</b> Socio-economic	Believes the proposal will negatively impact communities. S12.1
	<b>C15.1</b> Water	See C6.1 S3.6
	<b>C15.2</b> Water	Concerned about potential impacts to the alluvial aquifer. S3.2
	<b>C15.3</b> Water/ Agriculture	Concerned about potential impacts on valuable agricultural activities (associated with impacts to the aquifer). S3.2, 5.1
	<b>C15.4</b> Water	Concerned about potential impacts on Hunter River flows (associated with impacts to the aquifer). S3.4, 4.2.1
	<b>C15.5</b> Agriculture	See C5.1. Notes that Class 1 and 2 agricultural land is uncommon in the Hunter. S5.1
	<b>C15.6</b> Agriculture	See C10.5 S5.3
	<b>C15.7</b> Precedent/ water/ agriculture	See C6.5. Believes the proposal would set a precedent for future mining applications. S3.2, 5.2
16 White, Wendy	<b>C16.1</b> Socio-economic	See C6.4 S12.1
	<b>C16.2</b> Precedent/ water/ agriculture	See C6.5. Believes the proposal would set a precedent for mining of the rest of the alluvial flats, thus destroying the important Class 1 and 2 agricultural lands. S3.2, 5.2
	<b>C16.3</b> Water	See C6.3 S3.2, 3.4, 4.2.1
	<b>C16.4</b> Water	See C6.1 S3.6

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
17 Atkinson, Bev	<b>C16.5</b> Agriculture	Agricultural impacts. S5.1
	<b>C16.6</b> Cumulative	Timing of the proposal when farmers and Hunter residents are seriously questioning the adverse impacts of the coal industry. S13.1
	<b>C17.1</b> Water	Believes that no more mining should be undertaken in this river valley, especially close to the Hunter River. S4.6, 13.1
	<b>C17.2</b> Agriculture	See C.6.2. Believes the proposal is an unnatural threat to farming land. S5.1
	<b>C17.3</b> Socio-economic	Opposes the proposal as believes it is selling their birthright for quick profits involving pollution. S12.1, 13.1
	<b>C17.4</b> Agriculture	See C10.5 S5.3
18 Sheppard, Julie	<b>C17.5</b> Water	See C10.1 S3.2, 3.3, 3.4, 3.8, 4.2
	<b>C18.1</b> Water	See C6.1 S3.6
	<b>C18.2</b> Agriculture	See C6.2 S5.1
	<b>C18.3</b> Water	See C6.3 S3.2, 3.4, 4.2.1
	<b>C18.4</b> Socio-economic	See C6.4 S12.1
19 Ryan, James	<b>C18.5</b> Precedent/ water/ agriculture	See C6.5 S3.2, 5.2
	<b>C19.1</b> Water	See C6.1 S3.6
	<b>C19.2</b> Water	See C6.3 S3.2, 3.4, 4.2.1
	<b>C19.3</b> Precedent/ water	Concerned about setting an unacceptable precedent by allowing coal companies to destroy alluvial aquifers. S3.2
20 Henskens, Willem	<b>C19.4</b> Agriculture	See C6.2 S5.1
	<b>C20.1</b> Water	See C6.1 S3.6
	<b>C20.2</b> Agriculture	See C6.2 S5.1
	<b>C20.3</b> Water	See C6.3 S3.2, 3.4, 4.2.1
	<b>C20.4</b> Socio-economic	See C6.4 S12.1
21 Henskens, Frans	<b>C20.5</b> Precedent/ water/ agriculture	See C6.5 S3.2, 5.2
	<b>C21.1</b> Water	Concerned about the impacts of mining close to an aquifer, including safety risk to miners and river pollution. S3.2, 3.3, 4.2.3, 9.3



**Table A.1** Summary of community submissions and responses

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
22 See, Rosemary and Laurence	<b>C21.2</b> Water	Concerned about the impacts of river pollution on tourism.	S3.3, 4.2.3
	<b>C22.1</b> Water	See C6.1	S3.6
	<b>C22.2</b> Agriculture	See C6.2	S5.1
	<b>C22.3</b> Water	See C6.3	S3.2, 3.4, 4.2.1
	<b>C22.4</b> Socio-economic	See C6.4	S12.1
	<b>C22.5</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
23 Stanford, Richard	<b>C23.1</b> Socio-economic	See C6.4 and C17.3. The Hunter River system and associated alluvial flats are a priceless asset for future generations.	S12.1
	<b>C23.2</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
	<b>C23.3</b> Legislation	Submits that laws protecting alluvial soils, aquifers, rivers and streams should be strengthened and adhered to, without any exception.	S13.6
24 Gaines, Andrew	<b>C24.1</b> Greenhouse gas	Calls for a ban on coal fired power plants due to global warming.	S13.1, 13.3
	<b>C24.2</b> Agriculture	See C5.1	S5.1
	<b>C24.3</b> Agriculture	See C10.5	S5.3
	<b>C24.4</b> Water/ socio-economic	Destruction of water supplies by mining close to the Hunter River, and implications for the long term wellbeing of Australia.	S3.8, 4.2
25 Brough, Margaret	<b>C25.1</b> Water	See C6.1	S3.6
	<b>C25.2</b> Agriculture	See C6.2	S5.1
	<b>C25.3</b> Water	See C6.3	S3.2, 3.4, 4.2.1
	<b>C25.4</b> Socio-economic	See C6.4	S12.1
	<b>C25.5</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
	<b>C25.6</b> Cumulative/ socio-economic	Where will people live if we don't look after the planet?	S12.1, 13.1

**Table A.1** Summary of community submissions and responses

<b>Respondent</b>		<b>Issue</b>		<b>Addressed</b>	
26	Thatcher, Stephen	<b>C26.1</b>	Water	Concerned about impacts to the Hunter River, including impacts similar to Bowmans Creek in the 1980s, where mining caused the creek to stop flowing.	S4.2, 4.2.1
		<b>C26.2</b>	Water	See C6.1	S3.6
		<b>C26.3</b>	Agriculture	See C5.1 and C6.2 (references Bowmans Creek where there was no Class 1 or 2 agricultural land affected but farmers still felt the negative effects).	S5.1
		<b>C26.4</b>	Precedent	Government must realise the precedent the proposal would set if approved.	S3.2, 5.2
		<b>C26.5</b>	Cumulative	Supports calls for a moratorium on mining in the Hunter (to allow for proper consultation and planning).	S13.1
		<b>C26.6</b>	Socio-economic	Mining ventures are after profits no matter the consequences and community costs.	S12.1, 13.1
27	Murphy, Grace	<b>C27.1</b>	Noise and vibration	Believes increased noise levels from closer proximity of the proposal would negatively impact their business (thoroughbred horse breeding and rearing business within the zone of affectation) - already experiencing noise from existing pits.	S7.2
		<b>C27.2</b>	Noise and vibration	Feels there are inaccuracies in the EA noise modeling which suggests a decrease in noise levels. The proposal would bring mining operations closer to their property which, based on a common-sense approach, would increase noise.	S7.1
		<b>C27.3</b>	Noise and vibration	Concerned about closer proximity to increased blasting and vibration as sudden loud noises and shaking ground could cause pregnant mares to abort and young stock to run into fences and injure themselves.	S7.5.1
		<b>C27.4</b>	Air quality	See C1.1 (with negative impacts on their business).	S8.2
		<b>C27.5</b>	Socio-economic	Believes that if we and similarly affected business are unable to continue, this could have a cumulative negative impact on other local business they use as suppliers.	S12.3
		<b>C27.6</b>	Socio-economic	Feels their family has invested heavily financially and personally in developing their property and the proposal poses a serious risk to their future development plans.	S12.3
		<b>C27.7</b>	Socio-economic	The peaceful tranquil lifestyle once enjoyed is diminishing.	S12.4
		<b>C27.8</b>	Noise and vibration	See C3.4 (sleep disturbance).	S7.2, 7.3
		<b>C27.9</b>	Consent	Believes the proposal is contravening the original DA which prohibited mining the alluvial lands.	S3.8
		<b>C27.10</b>	Water	Believes not enough is known about the potential damage and long term effects to the water systems.	S3.1, 3.2, 4.1
		<b>C27.11</b>	Socio-economic	Accept that the government will generate a profit share through taxes however, local residents bear the negative impacts and do not reap direct or indirect financial rewards.	S12.1

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
	<b>C27.12</b> Socio-economic	Disagrees with 'local' economic benefits from spending power of employees, as presented in the EA, as only a small percentage of employees live locally, and it is larger regional centres that benefit from 'the 'spend'.	S12.3
	<b>C27.13</b> Socio-economic	Submits that employee numbers will not increase due to the proposal.	S12.5
	<b>C27.14</b> Socio-economic	Believes there is no improved infrastructure or housing development in Jerrys Plains.	S12.6
	<b>C27.15</b> Socio-economic	Believes there is a perception that current and future mining is negatively impacting property values and property is hard to sell in the area.	S12.2
	28 Crawford-Lane, Jill	<b>C28.1</b> Agriculture	The proposal will destroy alluvial soils.
	<b>C28.2</b> Water/ ecology	See C6.3. Concerned about impact to health of the Hunter River system, and that this will affect health of river dependent communities.	S3.2, 3.3, 3.4, 4.2, 4.2.1, 11.2.2
	<b>C28.3</b> Ecology/ cumulative	Believes approval of the proposal would be disastrous for the ecology and environment of the whole Hunter region.	S11.2.1
29 Imrie, Julia & Colin	<b>C29.1</b> Water	See C6.1	S3.6
	<b>C29.2</b> Agriculture	See C6.2	S5.1
	<b>C29.3</b> Water	See C6.3	S3.2, 3.4, 4.2.1
	<b>C29.4</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
	<b>C29.5</b> Water	Believes the proposal undervalues the critical role of groundwater resources and connectivity with surface waters.	S3.4
	<b>C29.6</b> Socio-economic	See C6.4	S12.1
30 McLean, Marg	<b>C30.1</b> Water	See C6.3. Best practice is a minimum standard. Notes that impacts of breaching alluvial aquifers on the groundwater system of the Hunter Valley are unacceptable.	S3.2, 3.4, 4.2.1
	<b>C30.2</b> Water	Concerned about loss of water flow. Notes that this may not even be apparent immediately, depending on the interconnectivity of groundwater systems. The Murray Darling Basin is given as an example of how the community would react to mining-related loss of water in the Hunter River.	S3.4, 4.2.1
	<b>C30.3</b> Agriculture	See C5.1	S5.1

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>	
31 Wills, Naida	<b>C30.4</b>	Precedent/ water/ agriculture	See C6.5. The proposed mining of alluvium is an unacceptable precedent.	S3.2, 5.2
	<b>C31.1</b>	Agriculture	See C5.1	S5.1
	<b>C31.2</b>	Agriculture	See C10.5	S5.3
	<b>C31.3</b>	Water	See C6.3. Raises that this is not in the interest of human long term sustainability.	S3.2, 3.4, 4.2.1
	<b>C31.4</b>	Water	The government should protect water supplies not cash in for short term gain with no idea how to restore the aquifers.	S3.8
	<b>C31.5</b>	Agriculture	States that the Hunter Valley is an important area of worldwide acclaim, known for its productive river flats and natural heritage.	S5.1
32 Denshire, Steve	<b>C31.6</b>	General environmental/ socio-economic	The government intending to allow such destruction is not acting in the public interest and should be held accountable for the environmental, social and heritage destruction which will result.	S12.1, 13.1
	<b>C32.1</b>	Cumulative/ socio-economic	See C7.2. Raises that the Hunter is over mined and the continual exploitation of local communities is having a detrimental effect on lives and local business.	S13.1
	<b>C32.2</b>	Water	The proposal would result in a contamination risk to the Hunter River and feather environmental impacts.	S3.3, 4.2.3, 13.1
	<b>C32.3</b>	Water	See C6.1	S3.6
	<b>C32.4</b>	Agriculture/ cumulative	See C6.2. Notes the cumulative loss of Hunter farmland due to coal mining.	S5.1
	<b>C32.5</b>	Greenhouse gas	Believes the proposal would result in more GHGs and encourage global warming and climate change.	S13.3
	<b>C32.6</b>	Water	See C6.3	S3.2, 3.4, 4.2.1
	<b>C32.7</b>	Socio-economic	Government needs to listen to the people and not Rio Tinto.	S12.1
	<b>C32.8</b>	General environmental/ cumulative/ socio-economic	Believes they are having their land, water, health, environment and livelihoods taken away from them.	S3.2, 3.4, 4.2, 5.1, 12.1, 13.1, Ch9, Ch12
33 Parker, Chris	<b>C32.9</b>	Socio-economic	Believes the Hunter has more to gain out of the environment than another coal mine.	S12.1
	<b>C33.1</b>	Water	See C6.1	S3.6

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>	
34 Fenwick, Janet	<b>C33.2</b>	Agriculture	See C6.2. Submits that 73% of rich agricultural land is already owned by coal mines in the Muswellbrook area.	S5.1
	<b>C33.3</b>	Agriculture	Concerned about increased future reliance on fresh food imports associated with a decline in suitable agricultural land.	S5.3
	<b>C33.4</b>	Water	See C6.3. Raises that the river is already suffering the impact of salt contamination closer to its mouth.	S3.2-3.4, 4.2.1, 4.6
	<b>C33.5</b>	Socio-economic	See C6.4. Notes that the Hunter agricultural land supports the Hunter and Sydney and is worth more to all of Australia in the future than 17Mt of coal.	S12.1
	<b>C33.6</b>	Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
	<b>C34.1</b>	Water	Concerned about the impact on water supply.	S3.4, 4.2.1
	<b>C34.2</b>	Water	Believes watercourses above the mine will lose flow.	S4.3
	<b>C34.3</b>	Water	Aquifers damaged by the proposal will probably never recover to their previous condition.	S3.2
	<b>C34.4</b>	Water	Will reduce the flow of water in the Hunter River.	S3.4, 4.2.1
	<b>C34.5</b>	Agriculture	Concerned about the cumulative reduction in agricultural land due to mining. Notes that there is a limited supply of prime agricultural land in the Hunter Valley.	S5.1
	<b>C34.6</b>	Agriculture	See C10.5	S5.3
	<b>C34.7</b>	Cumulative/ socio-economic	Concerned about the cumulative effects of mining on local communities - more smaller communities will vanish.	S12.4, 13.1
	<b>C34.8</b>	Air quality	See C1.1 (cumulative impacts).	S8.2
	<b>C34.9</b>	Noise and vibration	Cumulative noise impacts.	S7.2
<b>C34.10</b>	Rehabilitation	See C5.8.	S6.1	
<b>C34.11</b>	Socio-economic	Submits that consideration should be given to those who will be impacted rather than financial gain of the mining companies and state government.	S12.1	
35 Benson, Megan	<b>C35.1</b>	Cumulative	Objects on the grounds that the adverse effects of coal industry expansion have to date been largely unaccounted for by appropriate authorities. These include impacts on agricultural productivity, tourism and community health (air quality and water).	S13.1
	<b>C35.2</b>	Socio-economic	Community bears the long term burden of social, economic and environmental losses caused by coal mining expansion.	S12.1, 13.1

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
	<b>C35.3</b> Alternatives	Submits that viable alternatives to coal exist that allow a transition away from the industry. S13.7	
	<b>C35.4</b> Agriculture	See C6.2 S5.1	
	<b>C35.5</b> Cumulative	See C26.5 (until a plan has been developed by state government to protect food security and agricultural land). S13.1	
	<b>C35.6</b> Water	See C6.1 S3.6	
	<b>C35.7</b> Water	See C6.3 S3.2, 3.4, 4.2.1	
	<b>C35.8</b> Health/ air quality	See C4.1. Notes that pollution from the proposal adds to health risks already experienced in the Hunter Region. Quotes SMH Letter to the Editor: Coal contains heavy metals which are toxic to living organisms, especially when inhaled as fine particle dusts. Hunter Valley health statistics are just beginning to reveal the long-term impact of coal-dust inhalation on respiratory and cardiovascular diseases and cancer rates. S9.1.1, 9.2	
	36 Costello, Lisa	<b>C36.1</b> Water	See C6.1 S3.6
		<b>C36.2</b> Agriculture	See C6.2 S5.1
<b>C36.3</b> Water		See C6.3 S3.2, 3.4, 4.2.1	
<b>C36.4</b> Socio-economic		See C6.4 S12.1	
<b>C36.5</b> Precedent/ water/ agriculture		See C6.5 S3.2, 5.2	
<b>C36.6</b> Cumulative		Believes all coal mining should be stopped. S13.1	
<b>C36.7</b> Health		Believes coal mining is killing people. S9.2	
37 Maddison, Gary & Marilyn	<b>C37.1</b> Water	See C6.1 S3.6	
	<b>C37.2</b> Agriculture	See C6.2 S5.1	
	<b>C37.3</b> Water	See C6.3 S3.2, 3.4, 4.2.1	
	<b>C37.4</b> Socio-economic	See C6.4 S12.1	
38 Thrower, Baz	<b>C38.1</b> Water	See C6.1. Notes that such benefits should not be overridden for the benefit of large mining companies. S3.6	
	<b>C38.2</b> Agriculture	See C6.2 S5.1	
	<b>C38.3</b> Water	See C6.3. Raises the importance of healthy river systems. S3.2, 3.4, 4.2, 4.2.1	

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
39 Moors, Paul	<b>C38.4</b> Socio-economic	See C6.4	S12.1
	<b>C38.5</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
	<b>C39.1</b> Cumulative	Believes coal mining expansion should be stopped in NSW	S13.1
	<b>C39.2</b> Water	See C15.2	S3.2
	<b>C39.3</b> Cumulative/ socio-economic	Believes coal company behaviour should be brought under control of a government which is focussed on the sustainable long-term health of our land and the community's future.	S12.1, 13.1
40 Ventra, Tony and Joanne	<b>C40.1</b> Traffic and transport	Believes the proposal will increase traffic on the Golden Highway, affecting road safety, which is already risky without a safe turn off at Goldsville Road.	S13.4
	<b>C40.2</b> Air quality	See C1.1	S8.2
	<b>C40.3</b> Health/ air quality	See C4.1. Raises that eyes were recently irritated and watery due to pollution.	S9.1.1
	<b>C40.4</b> Noise	Concerned about noise impacts.	S7.2
	<b>C40.5</b> Socio-economic	Property devaluation.	S12.2
	<b>C40.6</b> Health	Submits that health and safety of locals should be a priority.	S9.3
41 Moore, Robyn	<b>C41.1</b> Agriculture	See C5.1	S5.1
	<b>C41.2</b> Rehabilitation	Disputes success of HVO's previous rehabilitation at the alluvial lands. It is a subsided eysores.	S6.2
	<b>C41.3</b> Rehabilitation/ agriculture/ socio-economic	See C5.8. Raises that the agricultural land is needed for future generations. Australian agriculture, especially in the Hunter will be gone forever.	S5.1, 6.1, 12.1
	<b>C41.4</b> Water	See C5.3 (caused by levees and groundwater barrier wall, with attendant damage to alluvial lands and the Hunter River.)	S4.2.4i
	<b>C41.5</b> Water	Farmers have restrictions and guidelines for protection of the river and alluviums. Mines should not be able to do what they want with no regard to these.	S3.6
	<b>C41.6</b> Water	It cannot be guaranteed that the underground aquifers will not flow into the mine and be contaminated with salt etc. States that once the water is contaminated it is gone forever and the Hunter River and aquifers are needed for future generations.	S3.3
	<b>C41.7</b> Agriculture	See C10.5 (impacts on Australia's food supply associated with impact on water and agricultural lands).	S5.3

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>	
42 Russell, Bruce	<b>C41.8</b>	Air quality	See C1.1 (at Jerrys Plains and surrounds).	S8.2
	<b>C41.9</b>	Noise and Vibration	See C5.5	S7.2
	<b>C41.10</b>	Health/ air quality	See C5.7	S9.1.1
	<b>C41.11</b>	Cumulative	Submits that the cumulative impact is out of control, especially at Jerrys Plains.	S13.1
	<b>C41.12</b>	Socio-economic	Consideration should be given to farmers.	S12.1
	<b>C42.1</b>	Water	The EA fails to provide drill logs (depth of soil types and gravels, flow rates and water quality) for the proposed extension area which demonstrate low permeability of aquifers. Believes there has been insufficient testing of the alluvium to accurately predict water bearing gravel and flow rates; it is necessary to know how much water is in the gravels to adequately assess the proposal.	S3.1
	<b>C42.2</b>	Water	14 piezos over West Pit is insufficient to provide reliable data. It is possible to disguise the true hydraulic condition of the aquifer system and miss underground streams with high connectivity to the Hunter River.	S3.1
	<b>C42.3</b>	Water	Believes the proposed extension area has higher hydraulic connectivity than stated.	S3.1
	<b>C42.4</b>	Cumulative	See C26.5 (until the Strategic Review on coal mining in the Hunter is completed and discussed publicly). The 2005 DIPNR policy must be endorsed in this review.	S13.1
	<b>C42.5</b>	Water	See C6.1	S3.1
	<b>C42.6</b>	Water	NSW Planning should commission independent regional water surveys that consider cumulative and long term mining impacts on groundwater and connectivity with river systems, including long term recovery of aquifers breached or disturbed by mining and implications to river flow and other water users.	S3.8
<b>C42.7</b>	Agriculture	See C5.1. Notes that only a small portion of the state is mapped as Class 1 or 2 and the loss of this land to the proposal is unjustifiable and irreversible.	S5.1	
<b>C42.8</b>	Socio-economic	It is the duty of the Minister to weigh up the economic benefits of jobs and royalties against economic losses to agriculture, costs to the environment (air pollution and remediation) and society (health).	S12.1	
<b>C42.9</b>	Socio-economic	Concurs with the Newcastle Herald statement that state governments are obsessed with making a fast buck from coalmining royalties and are ignoring long-term prosperity tied to the productivity of irreplaceable farmland.	S5.1, 6.1	
<b>C42.10</b>	Agriculture	Objects to mining and rehabilitation on alluvial lands, which can never be replaced.	S5.1, 6.1	
<b>C42.11</b>	Water	Impacts on streams	S3.3, 3.4, 4.2	



**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>
<b>C42.12</b>	Agriculture	See C28.1	S5.1
<b>C42.13</b>	Rehabilitation	Believes that rehabilitation areas are a poor reflection of the previous quality of the land.	S6.2
<b>C42.14</b>	Rehabilitation	Disputes success of previous attempts at rehabilitating class 1 and 2 agricultural lands. The 0-15m of top soil is rarely available and spoil fill and up to 30cm of topsoil is used instead. Much of the valuable resources is disposed of or dumped with mine rejects instead. Thousands of dollars are spent in the first 3 years of rehabilitation for Class 1 and 2 agricultural lands and after this the top soil is left in a terrible state, overgrown by weeds with an unlevel surface. This is unsuitable for crops and farm machinery.	S6.1, 6.2
<b>C42.15</b>	Water	See C15.2. Very little probability of successful restoration afterwards.	S3.2
<b>C42.16</b>	Water	Believes 6 to 8 wells were operating in the proposed extension area when the mine purchased the land. These will be unable to be reinstalled post mining.	S3.8
<b>C42.17</b>	Agriculture	Raises that the area will probably never produce food again.	S5.3
<b>C42.18</b>	Agriculture	Believes mine-owned farm land is in most cases not farmed with the same practices and level-of-care as private farms.	S5.1
<b>C42.19</b>	Water	Potential for up and downstream properties to be impacted by increased flood levels, particularly given the proposed levee and barrier wall.	S4.2.4i
<b>C42.20</b>	Water	The EA does not address the 1955 flood, which is the largest on record. This calls into question the flood predictions/ risk assessment in the EA.	S4.2.4ii
<b>C42.21</b>	Water	The maps show flood heights for the mine lease area only which is unacceptable. They must be estimated and mapped for the Lemington Road bridge and for the 1955 flood scenario.	S4.2.4ii, S4.2.4iii
<b>C42.22</b>	Socio-economic/ EA	The EA demonstrates a lack of interest in anything other than direct mine concerns.	S12.1, 13.1
<b>C42.23</b>	Water/ socio-economic	The EA must estimate the cost in lost crops, property, fences and other infrastructure to affected landholders, due to additional flood volume and spread from the proposal.	S4.2.4i
<b>C42.24</b>	Water	Does not have confidence that the barrier wall will perform adequately, ie prevent long term loss of Hunter River base flows to the infilled pit, particularly given depressurisation and blasting. The barrier wall has capacity to admit water from the Hunter beneath and around it. Notes the impact of such water losses to water users and the environment. Similarly believes the potential for transmission of saline groundwater into the river is too high risk to be allowed.	S3.4, 3.5

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
43 Shearer	<b>C42.25</b> Water	Believes a detailed assessment of the barrier wall construction, composition and permeability factors with margins of error should be provided, including performance criteria. S3.5
	<b>C42.26</b> Water	Believes there should be a detailed assessment of the existing barrier wall performance and all previous assessments, audits, reports and monitoring data for the existing wall must be made publicly available. S3.5
	<b>C42.27</b> Water	Concerned that there is no remediation technique for the event of barrier wall failure. S3.5
	<b>C42.28</b> Water	Concerned that no effective techniques exist for remediation of serious damage to rivers and creeks. S4.5
	<b>C42.29</b> Water	Believes DoP should employ an independent expert to oversee efficacy of the barrier wall. S3.5
	<b>C42.30</b> Adequacy review	Believes the EA should not have passed adequacy review. -
	<b>C42.31</b> Agriculture	Concerned about an area for future mining to the south of the proposed extension area which was flagged at a CCC meeting, a major part of which is high value river flood plain alluviums. S5.1
	<b>C43.1</b> Water	Concerned about interference with the flood plains, river and aquifer system. S3.2, 4.2, 4.2.4i
	<b>C43.2</b> Rehabilitation	See C5.8. Submits that the rehabilitated lands will not be capable of supporting economic viable agricultural enterprises; 30cm of topsoil over mining rubble has proven at HVO and elsewhere to be inadequate for supporting the original ecosystems and pasture and/ or woodland. Believes the rehabilitated land will be impossible to farm due to loss of alluvium and alluvial aquifers, and farm machinery will not be able to operate on subsided rubble. S6.1, 6.2
	<b>C43.3</b> Agriculture	See C10.5 S5.3
	<b>C43.4</b> Water	Objects to mining so close to the river. Also submits that we cannot allow same mistakes as the Murray Darling. S3.6, 4.2
	<b>C43.5</b> Water	The EA has not quantified existing pit seepage or reported pump out rates and volumes. S3.1
	<b>C43.6</b> Water	Submits that there is no piezo data in the EA or AEMR which would support claims that the bentonite wall is a reliable barrier and seepage from the river would not occur under or around it. S3.1, 3.5
	<b>C43.7</b> Water	Believes that until it can be categorically demonstrated that the unexplained water losses from the Hunter River, as reported to the Water Users by State Water, are not caused by mining, there must be an embargo on all mining that seeks to interfere with the Hunter River and its tributaries and alluviums. S3.8, 4.6
	<b>C43.8</b> Water	See C6.1 S3.6
	<b>C43.9</b> Water	Connection between the river and alluvial groundwaters must be acknowledged. S3.4

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
44 Laffan, Tony	<b>C43.10</b> Water	Concerned about the potential for permanent significant impacts on the Hunter River and associated disruption to water sharing plans. S3.6, 4.2
	<b>C43.11</b> Water	Submits that once a river or creek is cracked it cannot be remediated. S4.5
	<b>C43.12</b> Water	Raises that seepage losses cannot be adequately offset as seepage cannot be properly accounted for or regulated. Questions how seepage will be metered. S3.6
	<b>C43.13</b> Consent	Submits that conditions of the March 2009 consent relating to health and amenity are yet to be implemented; still waiting for his air conditioner. Believes that once mines have consent they forget about promises. S9.3
	<b>C43.14</b> Legislation	Objects due to failure of the regulatory system. S13.6
	<b>C43.15</b> Air quality	See C1.1. Notes that dust from the Lake James dam expansion is unbearable and concerned about more frequent exceedances of NEPM standard for PM <sub>10</sub> . S8.2
	<b>C43.16</b> Noise	See C40.4 S7.2
	<b>C43.17</b> Health/ air quality	See C4.1 (fine particulate matter). S9.1.1
	<b>C43.18</b> Air quality	Concerned that there is no suggestion of PM <sub>2.5</sub> monitors. S8.3
	<b>C43.19</b> Health/ air quality	Concerned that no health risk assessment (including long term cumulative assessment) was done for dust. S9.3
	<b>C44.1</b> Agriculture	See C6.2 S5.1
	<b>C44.2</b> Rehabilitation	See C5.8. Raises that the land was once very productive dairy farms and cannot and will not be rehabilitated to economically feasible and viable agricultural uses. S6.1
	<b>C44.3</b> Agriculture	See C10.5 (security of food production). S5.3
	<b>C44.4</b> Rehabilitation	The EA does not give clear commitment to retention of all alluvial soils for reuse in rehabilitation. Believes this should be a condition of consent. S6.3
	<b>C44.5</b> Water	Mining will destroy the alluviums and interfere with the aquifers. Believes that depressurisation will create risks of groundwater connectivity and risks to Hunter River base flow. S3.2, 3.4, 4.2.1
	<b>C44.6</b> Water	See C6.1 S3.6
	<b>C44.7</b> Water	Concerned about potential impacts on water quality and security. These must be preserved. S3.3, 3.4, 4.2.1, 4.2.3
	<b>C44.8</b> General environmental	Believes coal should be taken from less sensitive areas, and this land and the river banks should be protected. S13.1

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<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
45 Whatham, GW & JM	<b>C45.1</b> Water/ agriculture	Objects to mining of the Hunter River floodplain and removal of alluvial soils which cannot be replaced.	S4.2.4i, 5.1, 6.1, 6.3
	<b>C45.2</b> Agriculture/ cumulative	Believes agriculture is being forced out of Hunter Valley.	S5.1
	<b>C45.3</b> Agriculture	See C10.5 (food security).	S5.3
	<b>C45.4</b> Rehabilitation	See C5.8. Believes it is impossible to restore land to Class 2 as the top soil will sit on unconsolidated mine spoil which will settle and create land contours unsuitable for intensive agriculture, farm machinery, fencing and building.	S6.1
	<b>C45.5</b> Rehabilitation	States that crops on past rehabilitated alluvial land were not economical and after the initial lucerne crop the area became a degraded uneven weed paddock.	S6.2
	<b>C45.6</b> Water	See C6.1	S3.6
	<b>C45.7</b> Water	See C42.24	S3.4, 3.5
	<b>C45.8</b> Water	Believes the predicted 1cm increase in flood height could inundate hundreds of hectares of neighbouring farms and it is more sustainable to avoid mining on flood plains. Concerned that no compensation is offered for loss of crops or sheds from flooding due to the levee.	S4.2.4i
	<b>C45.9</b> Water	The EA does not address the 1955 flood.	S4.2.4ii
	<b>C45.10</b> Water	Questions why the barrier wall is needed and where the water is coming from.	S3.5
	<b>C45.11</b> Water	Believes the potential for under wall leakage is too great a risk and any losses to Hunter River base flow will impact other water users and be unable to be accounted for under the HUAWSP. Submits that leakage over time will not be minimal and will be unable to be remediated.	S3.4, 3.5, 3.6
	<b>C45.12</b>	Calls for a moratorium on mining of all agricultural lands, especially alluvial lands and aquifers near important creeks or rivers.	S13.1
	<b>C45.13</b> Water	See C44.7	S3.3, 3.4, 4.2.1, 4.2.3
	<b>C45.14</b> Water	Potential for saline water from fractured rock aquifers to accumulate and flow back into the river through fractures.	S3.3
	<b>C45.15</b> Water	Potential loss of Hunter River base flow from seepage into mine workings.	S3.4
	<b>C45.16</b> Water	No details of the barrier wall, eg depth, construction or permeability, are provided in the EA.	S3.5

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
46 Laffan, Amelia	<b>C45.17</b> Water	Concerned that there is no assessment of the existing wall to assure water users of long term effectiveness against river damage. Notes that there are anecdotal reports of existing leakage under the existing wall.	S3.5
	<b>C46.1</b> Rehabilitation/ visual	Objects to the proposal on the grounds that mining results in a permanent change to landscape.	S6.4, 13.2
	<b>C46.2</b> Water	Concerned about alteration to hydrological function of the landscape, with significant long term consequences for the surrounding environment and disruption of the relationship between surface and groundwater systems.	S3.4, 4.2
	<b>C46.3</b> Water	Depressurisation-related loss of base flow.	S3.4
	<b>C46.4</b> Water	Increased flood flow peaks.	S4.2.4i
	<b>C46.5</b> Ecology	Removal of natural vegetation	S11.2.1
	<b>C46.6</b> Agriculture	See C28.1	
	<b>C46.7</b> Agriculture/ water	Believes the NSW government should reject the proposal to mine Hunter alluviums and protection of the Hunter River, its tributaries and their alluvial lands is a priority.	S4.2, 5.1
47 Fenwick, Ronald	<b>C47.1</b> Water	Water availability.	S3.4, 4.2.1
	<b>C47.2</b> Agriculture	See C10.5	S5.3
	<b>C47.3</b> General environmental	Believes that mining companies always claim there will be little or no impact on land and water yet they cause irreversible damage.	S13.1
	<b>C47.4</b> Water	See C6.1	S3.6
	<b>C47.5</b> Agriculture/ rehabilitation	See C6.2. Believes the continued acquisition and devastation of these resources goes unchallenged and lands are never returned to similar to their pre-mining state.	S5.1, 6.1
	<b>C47.6</b> Water	See C6.3. References reports that land use practices which reduce groundwater recharge into rivers and streams could significantly reduce low flows in nearby rivers and streams; this must be considered when looking at mining influences on aquifers. Believes the mining industry will take the aquifers out of the equation for many generations.	S3.2, 3.4, 4.2.1
	<b>C47.7</b> Socio-economic	See C6.4. States that whilst the State and Commonwealth benefit economically, the region does not.	S12.1
	<b>C47.8</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2

**Table A.1** Summary of community submissions and responses

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
48 Smiles, Bev	<b>C48.1</b> Water	See C15.2. States that the paleochannel alluvium has known subsurface gravel braids, which have high permeability and provide good quality base flows direct to the river system. S3.1, 3.2
	<b>C48.2</b> Cumulative/ Agriculture	See C5.1 (cumulative loss) S5.1
	<b>C48.3</b> Precedent/ water/ agriculture	See C6.5. S3.2, 5.2
	<b>C48.4</b> Agriculture	See C10.5. Believes the proposal is a threat to future integrity of the best farming land available for food production in the Hunter region. S5.3
	<b>C48.5</b> Cumulative/ water	Believes that cumulative loss of base flows cannot continue without major irreversible damage to the Hunter River system. S3.4, 4.2, 4.2.1, 4.2.2
	<b>C48.6</b> Water	Connectivity between groundwater and surface water flows is very complex and has not been adequately assessed for long term unmitigated impacts. S3.4, 3.7
	<b>C48.7</b> Ecology	Concerned about impact on the fragmented remnants of wildlife habitat on the Hunter Valley floor. Notes that loss of hollow bearing and large mature trees is significant and declining woodland bird species, bats and arboreal mammals are impacted by ongoing loss of mature remnants. S11.2.1
	<b>C48.8</b> Ecology	Record of Powerful Owl use of the area to be destroyed is significant and should not be taken lightly. S11.2.3ii
	<b>C48.9</b> Cumulative/ ecology	Cumulative loss of mature remnant EECs has not been adequately assessed. S11.1
	<b>C48.10</b> Ecology	Potential impacts on the protected stand of River Red Gums and on the River Red Gum Recovery Strategy have not been identified. The River Red Gum Recovery Strategy is an important commitment. S11.2.3iii
	<b>C48.11</b> Greenhouse gas	Believes the proposed GHG emissions are irresponsible in light of State and Federal commitments to reduce emissions. S13.3
	<b>C48.12</b> Socio-economic	Believes the economic gain does not outweigh the long term, irreversible and uncosted damage of the proposal on current and future generations. S12.1
	<b>C48.13</b> Cumulative	Believes the DoP needs to develop a comprehensive landuse plan for the Hunter coalfields and revisit the Cumulative Impact Study conducted in 1998. S13.1
	<b>C48.14</b> Water	See C6.3. S3.2, 3.4, 4.2.1
49 Malvestiti, Peter	<b>C49.1</b> Rehabilitation	See C5.8. Believes the rehabilitated land will have no depth of soils and loams, will have poor quality underground water and be unable to sustain the use of bores or wells for agriculture as it once could. S3.3, 3.8, 6.1

**Table A.1** Summary of community submissions and responses

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>		
	<b>C49.2</b>	Agriculture/ socio-economic	See C10.5 (loss of future food production needs to be balanced against economic benefits).	S5.3, 12.1	
	<b>C49.3</b>	Water	Believes a flood of the 1955 magnitude would inundate the pit and workings with consequences for water and land quality.	S4.2.4ii	
	<b>C49.4</b>	Water	Believes the altered landscape from mining would mean a much larger area of private land and farms would be affected by a flood of the 1955 magnitude. The EA has dismissed this too easily.	S4.2.4ii	
	<b>C49.5</b>	Water	See C43.4.	S4.2	
	<b>C49.6</b>	Water	See C45.15 - net loss to other water users and the environment.	S3.4	
	<b>C49.7</b>	Water	Does not have confidence in long term function of the proposed barrier wall.	S3.5	
	<b>C49.8</b>	Water	Believes more details of the barrier wall and its expected performance should be provided, including performance criteria, trigger mechanisms and remediation measures should there be a problem.	S3.5	
	<b>C49.9</b>	Water	Concerned about the lack of a precautionary buffer from the Hunter River and the potential for saline water to reach the river.	S3.3, 3.5, 4.2, 4.2.3	
	<b>C49.10</b>	Cumulative/ air quality	Cumulative dust impacts from mining in the Hunter.	S8.2	
	<b>C49.11</b>	Air quality/health	See C4.1 (from cumulative dust in the longer term).	S9.1.1	
	<b>C49.12</b>	Cumulative	Objects to any further mine expansion until a comprehensive independent cumulative noise, dust, water, ecology and health assessment is done.	S13.1	
	<b>C49.13</b>	Cumulative	See C26.5 (until the Coal Strategy for the Hunter is completed).	S13.1	
	<b>C49.14</b>	Health	Eagerly awaits the NSW Health study.	S9.2	
50	Moses, James	<b>C50.1</b>	Acquisition	Does not support the proposal, subject to his ability to successfully negotiate heads of concern with Coal & Allied.	S13.9
		<b>C50.2</b>	Socio-economic	Believes the proposal will adversely impact amenity of their property so that the Moses family will be unable to continue to own and operate this farm. It is one of the few remaining grazing ventures in the area and has been in the family since 1930.	S12.4
		<b>C50.3</b>	Socio-economic	Notes that the closer proximity of mining activities to their property boundaries and the residences leads to conflict of interest with Coal & Allied.	S12.4

**Table A.1** Summary of community submissions and responses

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>
<b>C50.4</b>	Socio-economic	Conflict with quiet rural setting and features of 'life on the farm'.	S12.4
<b>C50.5</b>	Acquisition	Submits that his property is within a zone of affectation and subject to acquisition on request, however the terms of acquisition are such as to prevent achieving full value on sale to Coal & Allied. Concerned that if they exercise voluntary acquisition, the acquisition price would be significantly reduced due to earlier and adjoining mining developments.	S13.9
<b>C50.6</b>	Noise and vibration	Concerned about increased noise and vibration. The EA acknowledges high noise levels expected at receptor 10 but due to it being in a zone of affectation does not identify mitigation which may be undertaken to reduce predicted noise to acceptable levels. Does not specifically identify noise levels at the closest residence on the Moses property which would presumably be greater.	S7.1, 7.2, 7.4, 7.5.1
<b>C50.7</b>	Noise and vibration	See C3.4 (sleep disturbance - this is an existing problem and creates an employee relations problem for Moses)	S7.2, 7.3
<b>C50.8</b>	Noise and vibration	Believes overpressure from blasting at his property would be greater than indicated in the EA, given that the closest residence, cattle yards and stables are nearer than #10 (which was assessed) and the 35kg MIC used is very small - a charge of economic size is say 500 to 900kg MIC. Asks what blast overpressure could be expected from a blast of 500 to 900kg MIC at distances of 900m to 1500m.	S7.5.2
<b>C50.9</b>	Noise and vibration	States that ground vibration from blasts should also be considered. Believes ppv from larger economic size charges than considered in the EA are likely to exceed guidelines at distances of less than 900m.	S7.5.2
<b>C50.10</b>	Noise and vibration	Asks what size of charge would be required to give 10mm/s and 5mm/s ppv at their residence at 900m and at 1500m?	S7.5.2
<b>C50.11</b>	Noise and vibration	The EA indicates 500m from a blast site is a minimum safe distance for fly rock. Given that about 25% of the proposed extensions area is within 500m of their cattle yards, this is a risk to person and livestock.	S7.5.2
<b>C50.12</b>	Noise and vibration	Should not be expected to change long standing management practices to accommodate blasting.	S7.5.2
<b>C50.13</b>	Air quality	See C1.1. Increased impact of dust deposition on residences and pastures and perception that increased dust load is occurring.	S8.2
<b>C50.14</b>	Air quality	The EA does not specifically address the dust impact on the cottage and the hayshed/ stables/ yards, other than in the contour diagrams.	S8.1.1
<b>C50.15</b>	Health/ air quality	Concerned about dust deposition on the roof, which is the collection source for domestic water.	S8.2, 9.1.2
<b>C50.16</b>	Visual	States that there will be considerable visual amenity impact, including cumulative impact, given that the mine will be in much closer proximity to residences. Notes the perception of other impacts associated with the	S13.2



**Table A.1 Summary of community submissions and responses**

Respondent	Issue		Addressed
		visual impact.	
	<b>C50.17</b> Cumulative	Submits that the coal resource is considerable and when one mine finishes another proposal arises. Anticipates that other mining projects will continue to arise within the local area.	S13.1
	<b>C50.18</b> Visual	See C4.5	S13.2
	<b>C50.19</b> Traffic and transport	Traffic volumes, speeds and individual loads have greatly increased due to mining expansions. This poses a risk to employees and livestock which use the road and verges. It must be recognised that the proposal will have a sizeable workforce and equipment maintenance requirements which will maintain traffic volumes.	S13.4
	<b>C50.20</b> Cumulative	Cumulative impacts of mining, the effects if which are currently felt.	S13.1
	<b>C50.21</b> Socio-economic	Notes that they have been impacted by past mining but this is the closest and most intrusive to date.	S12.4
51	Brown, Graham	<b>C51.1</b> Water	See C6.1
		<b>C51.2</b> Agriculture	See C6.2
		<b>C51.3</b> Water	See C6.3
		<b>C51.4</b> Socio-economic	See C6.4
		<b>C51.5</b> Precedent/ water/ agriculture	See C6.5
52	More, Jenny	<b>C52.1</b> Water	See C43.4. The proposal would negatively impact surface and groundwater.
		<b>C52.2</b> Agriculture	See C5.1
		<b>C52.3</b> General environmental/ socio-economic	Believes the proposal only has short term benefits and threatens long term natural assets.
		<b>C52.4</b> Cumulative/ EA	Calls for a stop on new coal mines and expansions of existing ones. Calls for consideration of natural resources before mining.
53	Bennett, Maralyn	<b>C53.1</b> General environmental	States that despoiling the land is a serious problem.
		<b>C53.2</b> Alternatives	Raises issue with agencies approving coal mining applications and refusing to fast track alternative forms of energy.

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>	
54 Griffiths, Antoinette	<b>C53.3</b> Greenhouse gas	Concerned about climate change. References a previous period of excess atmospheric CO <sub>2</sub> which led to extinction of most life forms, and believes we are hastening this event.	S13.3
	<b>C53.4</b> General environmental	Asks for reconsideration of the proposal in the name of caring for the land, air and future.	S13.1
	<b>C54.1</b> Water	See C43.4.	S3.6, 4.2
	<b>C54.2</b> Cumulative/ general environmental	Opposes coal mining in general and believes we have a moral duty to protect the environment.	S13.1
	<b>C54.3</b> Water	See C6.1	S3.6
	<b>C54.4</b> Agriculture	See C6.2	S5.1
	<b>C54.5</b> Water	See C6.3	S3.2, 3.4, 4.2.1
	<b>C54.6</b> Socio-economic	See C6.4	S12.1
55 Bannister, Roland	<b>C54.7</b> Precedent/ water/ agriculture	See C6.5	S3.2, 5.2
	<b>C55.1</b> Socio-economic	Believes that the healthy rural character of the Hunter will be of greater value in the long term than another coal mining endeavour.	S12.1
	<b>C55.2</b> Cumulative	See C7.2 (wreckage caused by mining in the Hunter Valley.)	S13.1
56 De Jong, Thelma	<b>C55.3</b> Cumulative/ agriculture	Calls for mining to be phased out and agriculture encouraged.	S5.1, 13.1
	<b>C56.1</b> Water	See C15.2	S3.2
	<b>C56.2</b> Agriculture	See C5.1 (states that the destruction is irreversible).	S5.1, 6.1
	<b>C56.3</b> Water	Believes all water should be secured for food production and future generations.	S3.4, 4.2.1
	<b>C56.4</b> Cumulative	States that coal mining causes significant damage to environment, health and sustainability for further development.	S13.1, 13.8
	<b>C56.5</b> Socio-economic/ EA	Responsibility to provide a permanent sustainable resource for future generations and actions of interfering with water, agriculture, heritage and health should be considered before making an application.	S13.1
	<b>C56.6</b> Socio-economic	Believes consideration has only been given to company profits and short term royalties. Consideration has not	S3.4, 4.2.1, 12.1

**Table A.1 Summary of community submissions and responses**

Respondent		Issue		Addressed
			been given to the rights of future generations to employment or access to water, nor the rights of other industries and population centres to a clean permanent resource.	
		<b>C56.7</b> Legislation	Require a new approach to protection and sustainability of land and water for future generations, particularly given the increase in population and limited productive land and water resource.	S13.6
57	Bennett, Terry and Lynne	<b>C57.1</b> Agriculture/ cumulative/ socio-economic	See C5.1 (and alluvial plans). This land is the livelihood of many farmers and to have more of it desecrated by mining would be detrimental for the people that live in the area.	S5.1
		<b>C57.2</b> Agriculture/ water	Require stable and fertile soils and continuity of underground streams to grow crops.	S3.2, 5.1
		<b>C57.3</b> Water	Require stable levels of the Hunter River for irrigation	S4.2.1
		<b>C57.4</b> Water	The stated 1m rise in the river level will mean flooding of river flats and associated damage to farmland will be more extensive. This is unacceptable as this land is their livelihood. Also, they will have to pull their pumps out at times.	S4.2.4i
		<b>C57.5</b> Rehabilitation/ agriculture/ water	The post-mining land will not be suitable for future crops or farming. The ground will be filled with rock and topsoil placed on top that won't hold water for irrigation purposes, therefore wasting water and it will just seep straight through the ground. The aqua flow will be ruined - these underground streams will be broken and seep into the river.	S3.1, 6.1
		<b>C57.6</b> Socio-economic	See C40.5. This has already occurred due to mining activity in the area. There are few buyers due to noise, dust, light and vibration impacts. There are residents within the exclusion zone and just outside it that cannot sell their properties. Rapid growth rate of mining at Jerrys Plains is making it almost impossible to sell properties.	S12.2
		<b>C57.7</b> Agriculture	Objects to any coal mining on agricultural land.	S5.1
59	Barry, Don	<b>C59.1</b> Noise and vibration	See C5.5	S7.2
		<b>C59.2</b> Air quality	See C1.1. Increased coal dust in Jerrys Plains and the district.	S8.2
		<b>C59.3</b> Agriculture	See C5.1	S5.1
		<b>C59.4</b> Water	Proposal will force water levels upstream in time of flood.	S4.2.4i
		<b>C59.5</b> Water	Proposal will destroy underground aquifers and increase salinity within river system.	S3.2, 3.3, 4.2.3
60	Holz, Philip and Casey	<b>C60.1</b> Consultation/ communication	Lack of community consultation. Objects to one on one approach and only notification in newspapers.	S13.5

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
<b>C60.2</b>	Socio-economic The project will negatively impact the health, lifestyle and property values of the surrounding communities from extra noise, dust and pollution.	S7.2, 8.2, 9.1.1, 12.2, 12.4
<b>C60.3</b>	Air quality Real time PM <sub>10</sub> and PM <sub>2.5</sub> monitors need to be installed across the community.	S8.3
<b>C60.4</b>	Health/ air quality Dust from mining contaminates the drinking water.	S9.1.2
<b>C60.5</b>	Socio-economic See C40.5.	S12.2
<b>C60.6</b>	Regulations Criteria regarding environmental impact and blasting regulations are set too low for mining companies with many escape clauses.	S13.6
<b>C60.7</b>	Consultation/ communication On-going project changes eventuate from proposals with limited consultation. Wants to see Coal & Allied's full plan for the area.	S13.5
<b>C60.8</b>	Socio-economic Jerrys Plains was not included on the regional setting map. Coal & Allied has not provided a sufficient social study on the impacts of the proposal.	S12.1, 12.6
<b>C60.9</b>	Socio-economic Wants an ongoing monetary trust fund set up for the township of Jerrys Plains if the proposal is approved to compensate for the negative impacts.	S12.3
<b>C60.10</b>	Traffic and transport Wants the intersection of Lemington Road and the Golden Hwy upgraded before work starts as a condition of consent with designated turning lanes for traffic turning into Lemington Road and running lanes for traffic entering Golden Hwy. Intersection is dangerous. Was led to believe upgrade of intersection was a condition of previous proposal.	S13.4
<b>C60.11</b>	Socio-economic Wants the Homestead on property 10 protected through a maintenance plan, to avoid the same predicament to that of Wambo homestead.	S12.6
<b>C60.12</b>	Water Coal & Allied haven't provided adequate details ie. depth, construction methods and permeability of the proposed bentonite wall. Questions whether existing wall is effective as has heard that excess water is leaking into mine voids possibly through the existing wall.	S3.5
<b>C60.13</b>	Water Concerned about levee system causing floods and damaging properties. Wants removal of existing levees before new levees are approved to reduce risk as well as Coal & Allied providing compensation for damage to assets and crops in the event of a flood.	S4.2.4i, 6.1
<b>C60.14</b>	Water See C6.1	S3.6
<b>C60.15</b>	Rehabilitation The Hunter River Flats proposed to be mined will never be replaced. Coal & Allied don't guarantee that agricultural suitability will be as good as pre mining after rehabilitation.	S6.1

**Table A.1 Summary of community submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
61 Oloffson, Deidre	<b>C60.16</b> Rehabilitation	Coal & Allied claim that their experience at rehabilitating alluvial land has been successful but doesn't state the amount of fertiliser and water used to grow successful crops nor the time a Lucerne crop lasts. S6.2
	<b>C60.17</b> Rehabilitation	The effects of natural flooding on rehabilitated land is unknown. Needs to be assessed before alluvial lands are mined. S6.4
	<b>C60.18</b> Water	Concerned about impacts of proposal on Hunter River and the increasing population and businesses that rely on this water supply. S4.2
	<b>C60.19</b> Water	Changes to surface water runoff patterns and underground water connectivity with the Hunter River are cause for concern. S3.2, 4.2, 4.2.1
	<b>C60.20</b> Precedent/ agriculture	Allowing mining of highly productive Hunter River flats is far from sustainable and could set a very dangerous precedent. S5.2
	<b>C60.21</b> Consultation/ communications	If changes are required to the EA wants Coal & Allied's response to the changes be placed on public display and a public submission period re-opened. S13.5
	<b>C61.1</b> Agriculture/ water	Against the destruction of our aquifers and agricultural land beyond state of no return. S3.2, 5.1, 6.1
	<b>C61.2</b> Agriculture/ water	Should be securing all water for food production and ensure sustainability of resource for community and future generations. S3.4, 4.2.1
	<b>C61.3</b> General environmental/ EA	Extraction of coal causes significant damage to environment, health and sustainability for further development. Actions of interfering with water, agriculture, heritage and health should be considered before making an application. S13.1, 13.8
	62 Bowman, Wendy	<b>C62.1</b> Agriculture
<b>C62.2</b> Socio-economic/ Water		Water resources must be left in tact for future generations. S12.1, 4.2
<b>C62.3</b> Agriculture		Australia's future is in agriculture, which can go on forever. Mining is finite. S5.1
<b>C62.4</b> Water		Lists the following principles of the <i>Water Management Act</i> : total compliance with the Act, water quality, water sharing plan, ensuring efficiency and no aquifer interference. S3.6
<b>C62.5</b> Soils/ Water/ Ecology		States that activities must avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination and acidity, water bogging and decline of native vegetation. S4.2.3, 4.5, 11.2.1, Ch 5, Ch 6
<b>C62.6</b> Rehabilitation		States that land must be rehabilitated. S6.4

**Table A.1** Summary of community submissions and responses

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
<b>C62.7</b>	Water Raises that no mining in the Hunter Valley to date has had minimal impact. Cites impacts on Bowmans Creek, Bayswater Creek, Wambo Creek and Elli Creek, which were used for irrigation and have been contaminated or disappeared.	Ch 3, Ch 4 and S12.1
<b>C62.8</b>	Water See C43.7	S3.8, 4.6
<b>C62.9</b>	Water Seepage into pits occurs constantly, and is water that would otherwise flow into the river.	S3.4
<b>C62.10</b>	Water The Hunter Valley contains complex and unpredictable geological features with numerous fault lines. The effects of these on hydraulic conductivity is not known.	S3.1
<b>C62.11</b>	Water Assumptions made by experts from other states predict too great a margin of error.	S3.1, 4.1
<b>C62.12</b>	Socio-economic The project must take into account the principles of ESD.	S13.8
<b>C62.13</b>	Socio-economic The economic costs of mining impacts have not been adequately considered. Mining is for short-term gain but can have long-term impacts.	S12.1
<b>C62.14</b>	Ecology The proposal will be an ecological disaster.	S11.2.1
<b>C62.15</b>	Water Concerned about potential impacts of the proposal on the Hunter River and downstream water users. This includes impacts of altered or contaminated flows in a large flood, and sedimentation of the river prior to or after rehabilitation (from soils washing into the river).	S4.2, 4.2.3, 4.2.4i
<b>C62.16</b>	Agriculture/ water Alluviums must remain in tact.	S3.2, 5.1
<b>C62.17</b>	Rehabilitation Believes the only areas which have been mined successfully by scraping the top soils back are those at which the base rock strata has not been blasted. Backfilling the pit would result in unconsolidated mine spoil, which would subside resulting in an uneven surface which cannot be farmed.	S6.1
<b>C62.18</b>	Rehabilitation Coal & Allied's previous rehabilitation at the Hunter Valley No. 1 Mine cannot be farmed due to subsidence and is suitable for grazing only.	S6.1, 6.2
<b>C62.19</b>	EA The EA plays down the proposed effects.	S13.1
<b>C62.20</b>	Cumulative Continuing effects of mining can be seen all over the Muswellbrook and Singleton Shires.	S13.1
<b>C62.21</b>	Water The HRSTS has reduced salinity but water from fractured aquifers still contaminates the river.	S3.3
<b>C62.22</b>	Water Questions the finding 'pit inundation is expected to slightly increase' when no hydrological study has been conducted for the whole valley.	S3.1
<b>C62.23</b>	Water Where do the aquifers rise? Where are they in a 50km radius of the lease? What quantity of water is contained	S3.2, 3.4

**Table A.1** Summary of community submissions and responses

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>
		in the aquifers and what amount is being conveyed to the river?	
<b>C62.24</b>	Water	Raises impacts on flooding. These are based on supposition. Hunter River floods are unpredictable, fast flowing and destructive.	S4.1, 4.2.4i
<b>C62.25</b>	Water	Raises stability of the levees and potential for earth used in their construction to lead to sedimentation of the Hunter River.	S4.2.3
<b>C62.26</b>	Rehabilitation	All alluvial soils stripped must be placed on the flats not the reshaped overburden.	S6.3
<b>C62.27</b>	Rehabilitation	All rehabilitation sites in the Hunter are a disaster, as soil has leached away.	S4.2.3, 6.2
<b>C62.28</b>	Water	The entire area is flood prone. Raises the 1955 flood.	S4.2.4i, 4.2.4ii
<b>C62.29</b>	Agriculture	The land to be mined was once productive dairy farms.	S5.1
<b>C62.30</b>	Socio-economic	References recent P.A.C decision for BHP proposal south of Sydney 'society would be better off if the coal remained in the ground'. Believes this should be applied to the proposal.	S12.1

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## Appendix B

### Non-government organisation submissions

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**Table B.1 Summary of non-government organisation submissions and responses**

Respondent		Issue		Addressed	
N1	Nature Conservation Council of NSW	N1.1	Water	Believe there is insufficient technical assessment of the potential impacts to make an informed decision on the proposal (in relation to permanent destruction of alluvial floodplain and groundwater system within 200m of the Hunter River, resulting in a loss of base flows to the river).	S3.1, 3.2, 3.4, 4.1
		N1.2	Water	Believe an insufficient number of piezometers were used to collect data, given that the paleochannel is a complex system and has subsurface gravel braids with permeabilities well in excess of 100m/ day.	S3.1
		N1.3	Water	Feel that high rainfall events could increase seepage and cannot be used as a mitigating influence; loss of base flows will still occur regardless of weather conditions. The seepage predictions do not take into account that over more than 50 years, loss of base flows to the river could be more than 900ML.	S3.1, 3.4
		N1.4	Water	Question how seepage offsets will be undertaken. If licenses are purchased, it is unclear what will happen after close of mining. No explanation is given of the process by which licences could be relinquished (if required).	S3.6
		N1.5	Water	There is no detailed description of the proposed barrier wall including construction, composition, permeability or performance criteria or risk assessment of it failing. There is no identification of measures to mitigate failure/ compromise of the barrier wall and prevent larger base flow losses to the Hunter River.	S3.5
		N1.6	Water	There is no detailed assessment of the performance of the existing barrier wall.	S3.5
		N1.7	Water	The proposal has failed to recognise the significance of base flows to the environmental integrity of river systems and the significant interconnection of groundwater to surface water in the Hunter system.	S3.4
		N1.8	Ecology	The EA has not recognised micro-organisms that have evolved around the interconnection between groundwater and surface water, which have an important function in the aquatic food chain.	S11.2.4
		N1.9	Ecology	Concerned that enlargement of the evaporative sink will bring it within 500m of a Hunter River Red Gum EEC, which was protected under a previous approval agreement.	S11.2.3iii
		N1.10	Ecology	Believe the proximity of the proposed enlarged evaporative sink to the Hunter River Red Gum EEC, Carrington billabong ecosystem and the Hunter River is a major threat to the riverine ecology.	S11.2.2
		N1.11	Water/ Ecology	Believe that a breach of the sump in a major flood could cause highly saline and contaminated water to impact on the conservation values of the stand of Hunter River Red Gum, the Carrington Billabong ecosystem and the Hunter River. Submit that the proposal assessment does not address or mitigate this possible impact.	S11.2.2

**Table B.1 Summary of non-government organisation submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
<b>N1.12</b>	Agriculture	Oppose the proposed destruction of 137ha of Class 1 and Class 2 primary production land, previously used for irrigated crops. S5.1
<b>N1.13</b>	Agriculture	Believe the proposal will destroy additional alluvial river flats in closer proximity to the Hunter River. S5.1
<b>N1.14</b>	Rehabilitation	Submit that the proponent needs to substantiate claims that 63ha at the Alluvial Lands was successfully rehabilitated to Class 1 and Class 2 lands with crop yields at least equivalent to those on nearby farms. Believe the condition of the soil and reinstatement of the associated alluvium has not been clearly demonstrated and the level of ongoing inputs and management required to maintain the reclaimed river flats has not been presented. S5.1, 6.1, 6.2
<b>N1.15</b>	Agriculture	Concerned about cumulative effect of the proposed destruction of alluvial lands for this proposal and elsewhere at HVO North. S5.1
<b>N1.16</b>	Water	The NSW government should apply the policy from the draft Management Stream Aquifer Systems in Coal Mining Developments- Hunter region which requires a 150m buffer zone between the high wall of mining operations and alluvial aquifers. S3.6
<b>N1.17</b>	Precedent. agriculture	The proposal would set a dangerous precedent which would leave all alluvial floodplains open to mining pressures. S3.2, 5.2
<b>N1.18</b>	Water	Believe the loss of base flows to the Hunter River has been underestimated, when considering the cumulative impacts of current disturbance of the paleochannel alluvium. S3.1, 3.4
<b>N1.19</b>	Water/ rehabilitation	Oppose the proposal on the grounds that destroyed alluvial aquifer systems cannot be rehabilitated. It is impossible for rehabilitated pits to perform the same functions as an alluvial aquifer- the backfill materials do not have the same structure, porosity or layers as an alluvial aquifer. The ability of the rehabilitated pit to hold water and slowly release it over time in a similar way to a functioning alluvial aquifer, thus storing base flows over time, has not been demonstrated. The loss of base flow storage from the disturbed alluvium is unlikely to be replaced. S6.1
<b>N1.20</b>	Water/ rehabilitation	Believe rainfall infiltration is likely to move directly through the backfill materials and into the river. S3.8
<b>N1.21</b>	Water/ cumulative	Believe the past, current and proposed impacts on the groundwater and surface water systems associated with the Hunter River have not been adequately identified. The existing and proposed coal mining operations in the Hunter Valley have a major cumulative degrading impact on the health and functionality of the Hunter River system. The ongoing loss of groundwater connectivity, base flows, and S3.1, 3.4, 4.2, 4.2.2

Table B.1 Summary of non-government organisation submissions and responses

Respondent	Issue	Addressed
		surface stream integrity through diversions associated with mining operations have not been seriously considered or clearly documented. The proposal cannot be considered in isolation – it will have compounding, irreversible impacts on the Hunter River system.
	<b>N1.22</b> Socio-economic	Believe revenue from the proposal has not been considered in the context of permanent loss of production from prime agricultural land and alluvial aquifer function. An economic value has not been given to these over time. S3.2, 6.1, 12.1
	<b>N1.23</b> Rehabilitation	The level of inputs and management required to maintain a similar level of food production from rehabilitated mine land over any period of time has not been calculated. S6.1
	<b>N1.24</b> Socio-economic	Irreversible environmental damage caused by the proposal must be given a value over the long term. S12.1, 13.1
	<b>N1.25</b> Greenhouse gas	Believe the proposed GHG emissions over the life of the operation are unacceptable and contrary to the NSW government policy to reduce emissions by 2020. S13.3
<b>N2</b> Australian Water Campaigners Inc	<b>N2.1</b> Water	The proposal contravenes the draft guidelines ' <i>Management of Stream/ Aquifer Systems in Coal Mining Developments 2005</i> ' which give alluvial aquifers a 150m buffer from mining activities S3.6
	<b>N2.2</b> Water	Due to Item N2.1, the proposal poses a threat to groundwater systems of the Hunter Valley. As groundwater provides base flows which sustain the Hunter River, this is unacceptable. S3.4
	<b>N2.3</b> Socio-economic	Believe a healthy Hunter River system and its productive river flats are worth more to society in the long term than 17Mt of coal. S12.1
	<b>N2.4</b> Socio-economic	State that the above principle (Item N2.3) has been established in the PAC review of the Bulli Seam proposal in the Southern Coalfields, which states 'so while protection of the significant natural features would involve lower mine profitability, it is likely that society as a whole would gain more from the environmental protection recommended than it would lose in terms of foregone profits'. Submit that the same principle of valuing potential private gain ahead of the loss of benefit to the community of a permanent asset, namely a major NSW river and an important aquifer, apply in this case. Call upon the DoP to act consistently with the Bulli Seam PAC and reject the proposal on the basis of social equity. S12.1
	<b>N2.5</b> Water	Reference a recent CSIRO report which states 'Groundwater threat to rivers worse than suspected' and 'Excessive groundwater development represents a greater threat to nearby rivers and streams during dry periods (low flows) than previously thought, according to CSIRO research...' S3.1
	<b>N2.6</b> Precedent/ agriculture	Believe that if the proposal is approved it will set a precedent threatening the rest of the Hunter alluvium. S3.2, 5.2

**Table B.1 Summary of non-government organisation submissions and responses**

Respondent		Issue		Addressed	
N3	North East Forest Alliance	N2.7	Water	Object to the proposal on the grounds that it will destroy the alluvial aquifer.	S3.2
		N2.8	Agriculture	Believe the proposal will result in a cumulative loss of Class 1 and Class 2 agricultural land in the Hunter Valley.	S5.1
		N2.9	General environmental	Call for the application to be rejected on the basis of environmental threats.	S13.1
		N2.10	Socio-economic	Call for the application to be rejected on the basis of social losses (loss of productive farming land).	S5.1, 12.1
		N3.1	Cumulative	Believe coal mining should cease in the Hunter Valley due to environmental, health and wellbeing impacts and the need to address climate change.	S13.1
		N3.2	Water	See N2.7	S3.2
		N3.3	Water	Object to the proposal on the grounds that it will remove base flows from the river.	S3.4, 4.2.1
		N3.4	Water	See N2.1	S3.6
		N3.5	Agriculture	See N2.8	S5.1
		N3.6	General environmental/ ecology	Concerned about environmental/ ecological impacts.	S11.2.1, 13.1
N4	Jerrys Plains & District Progress Association	N3.7	Socio-economic	The proposal would be short-sighted economically by gaining polluting coal, whilst sustaining substantial long term losses.	S12.1
		N4.1	Air quality	Concerned about increased dust at Jerrys Pains and surrounds. The area is already subject to pollution from mines and power stations.	S8.2
		N4.2	Health/ air quality	Concerned about health impacts of particulate pollution, even if below guideline levels.	S9.1.1
		N4.3	Noise and vibration	Concerned about increased noise at Jerrys Pains and surrounds, including from increased traffic, blasts and coal trains due to the proposal. Already subject to pollution from mines and power stations.	S7.2
		N4.4	Agriculture/ socio-economic	Concerned about disruption to agricultural balance of the area.	S5.1
N4.5	Water	Concerned about impacts of the levee on peak Hunter River flows, specifically elevated upstream water levels and increased downstream velocities.	S4.2.4i		

**Table B.1 Summary of non-government organisation submissions and responses**

Respondent			Issue	Addressed	
N5	Hunter Environment Lobby	Environment	N4.6 Water	Disturbance to water quality associated with disruption to the water table and aquifers that feed the Hunter and associated loss of Hunter River water for agricultural uses.	S3.2, 3.3, 3.4, 4.2.1, 4.2.3
			N4.7 Agriculture	Concerned about damage to alluvial land and loss of prime agricultural land.	S5.1
			N4.8 Agriculture	See N1.17	S3.2, 5.2
			N5.1 Agriculture	Concerned about impact on alluvial lands.	S5.1
			N5.2 Cumulative/ EA	The EA does not adequately consider issues of regional scale such as visual impacts, night lighting effects on biodiversity, environmental monitoring, threatened species and biodiversity considerations.	S3.7, 4.3, 7.3, 8.3, 13.1
			N5.3 Alternatives/ ESD	The EA does not comply with the EP&A Regulation in that it does not adequately analyse feasible alternatives or adequately assess the proposal in accordance with ESD principles.	S13.7, 13.8
			N5.4 Legislation	The proposal does not comply with a principal aim of the Singleton Local Environmental Plan 1996 (LEP), Clause 2(g), which seeks to encourage adoption of land management practices which are sustainable over long periods of time without degradation of natural environmental systems. Similarly, it does not conform with the zone objectives in Clause 10b of the LEP.	S13.6
			N5.5 Ecology	This proposal will contribute to the loss of important habitat for NSW listed threatened species, and for nationally listed species under the EPBC Act.	S11.2.3i
			N5.6 Ecology	Further clearing of vegetation is unacceptable and contrary to the objects of the <i>Native Vegetation Act 2003</i> and NSW Government policy.	S11.2.1
			N5.7 Ecology	The proposal should be rejected unless adequate long term offsets can be provided and secured in perpetuity.	S11.3.1
			N5.8 Ecology	Any commitment by the proponent cannot be accepted, given that other Hunter Valley projects including Mt Owen Mine and Warkworth have not met their legal commitments to offsets and are now mining, or proposing to mine in areas that have been committed for biodiversity offsets.	S11.3.1
N5.9 Water	The proposal represents unsustainable water use. Failure to properly assess and document water impacts in the EA mean the proposal is flawed.	S3.1, 4.1, 4.4			
N5.10 Water	The proposed extraction of water from the river system (by mining of alluvial lands) is contrary to the water sharing plans.	S3.6			
N5.11 Water	See N2.1	S3.6			

**Table B.1** Summary of non-government organisation submissions and responses

Respondent	Issue	Addressed
	<b>N5.12</b> Water	Proposed extraction of water from the river will not be able to be metered and therefore compliance with the terms of the water sharing plans and the <i>Water Management Act 2000</i> cannot be evaluated. S3.6
	<b>N5.13</b> Water	The risks to groundwater and the Hunter River system are too great. S3.2, 3.4, 4.2
	<b>N5.14</b> Water	An independent technical assessment of water impacts must be undertaken, including a risk assessment by the insurance industry which can provide financial compensation in the event that the assurances in the EA fail to eventuate. S3.8, 4.6
	<b>N5.15</b> Air quality	The general environmental monitoring program proposed is inadequate to be able to assess the development within a regional context, and to link with other regional air quality monitoring programs. This requires a program of regional monitoring undertaken by an independent authority. The ongoing management commitments given are vague and unenforceable. S8.3
	<b>N5.16</b> Cumulative	The EA provides inadequate assessment of cumulative impacts at appropriate scales - in particular greenhouse, biodiversity and water quality impacts must be considered at national, regional and catchment scales. S13.1
	<b>N5.17</b> Greenhouse gas	GHG emissions are given inadequate attention in the EA - contribution is substantial and crucial to determining ecological sustainability of the proposal. S13.3
	<b>N6</b> Rivers SOS	<b>N6.1</b> Water
<b>N6.2</b> Water		Call for a minimum 1km mining safety zone around all rivers in the state. Cracking and pollution of rivers caused by poorly regulated mining operations is one cause of the degradation of NSW rivers. Water supplies can never be re-built. Remediation attempts are inadequate and not effective in the long term. The integrity of water supplies has never been more threatened. S4.6
<b>N6.3</b> Socio-economic/ EA		Concerned about the level of impacts predicted and deemed acceptable by mining companies and DPI. There is a huge difference between stakeholders such as the mines, environment groups, government agencies and water users as to what level of impact is acceptable and how to best manage them. Notes that this issue is raised in a DECCW document. S13.1
<b>N6.4</b> Water		Believe any impacts to water courses, alluvium or water dependent ecosystems should be avoided. S3.2, 3.4, 3.6
<b>N6.5</b> Water		DECCW has expressed concerns with respect to available remediation techniques, should the impacts identified in N6.4 eventuate. S3.7, 4.5
<b>N6.6</b> Water		The above is a view supported by the NSW Office of Water in their draft policy 2005 Guidelines. S3.6



**Table B.1** Summary of non-government organisation submissions and responses

Respondent	Issue		Addressed	
	<b>N6.7</b>	Water	Call for protection of water security, river systems and drinking water supply catchments in this era of water shortages, and raised issue of sustainable water use.	S4.4, 4.6
	<b>N6.8</b>	General environmental	Submit that the proposal and its impacts are of an enormous scale.	S13.1
	<b>N6.9</b>	Cumulative	Cumulative impacts of this proposal with those of other mining operations in the Hunter.	S13.1
	<b>N6.10</b>	Cumulative	Call for a moratorium on open cut mining in the region until the Strategic Review of Coal Mining in the Hunter is completed and thoroughly reviewed and the full cumulative effects (eg biodiversity, water, air quality, health, amenity and property values) are properly and scientifically understood. The likely significant consequences are complex.	S13.1
	<b>N6.11</b>	Rehabilitation	Submit that the proposed extension area is on prime agricultural, floodplain land which in the past supported intensive agricultural dairying enterprises. At the end of mining it will be a spoil filled pit loosely covered with topsoil which over a short period of time will resettle and cause an undulating topography unsuitable for farming. Rehabilitation cannot be relied on to return it to the class 1 or 2 agricultural land it once was as the amount of money required to sustain it at that level would be economically unviable for any farming enterprise.	S6.1
	<b>N6.12</b>	Water	The alluvial groundwater will be gone and the water table become salty.	S3.2, 3.3
	<b>N6.13</b>	Water	Concerned about the impact on the Hunter River; the Hunter Regulated River is already the most stressed coastal river due to land use and climate change.	S4.2, 4.6
	<b>N6.14</b>	Water	The success of isolating the mining operation from the alluvial groundwater system is very complex and presents unacceptable risks. Support calls for a mining exclusion zone.	S3.5, 3.6
	<b>N6.15</b>	Water	Object to the proposal due to its potential to have a major impact on the alluvial system and Hunter River base flows, particularly the potential for water loss through fracture interception, upsetting the balance between needs of water users and the environment.	S3.2, 3.4, 4.2
	<b>N6.16</b>	Water	Believes the pit is too close to the river to offer adequate protection. Interruption to groundwater pathways through the alluviums, to and from the river, has not been adequately assessed.	S3.1, 4.2
	<b>N6.17</b>	Water	Submit that the fact that a levee and barrier wall are necessary indicates there are serious potential problems.	S3.5, 3.8
	<b>N6.18</b>	Water	The EA has not quantified existing pit seepage or reported pump out rates and volumes.	S3.1

**Table B.1 Summary of non-government organisation submissions and responses**

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>	
	<b>N6.19</b>	Water	Submit that there is no piezo data in the EA or AEMR which would support claims that the bentonite wall is a reliable barrier and seepage from the river would not occur under or around it.	S3.1, 3.5
	<b>N6.20</b>	Water/ cumulative	Believe that until it can be categorically demonstrated that the unexplained water losses from the Hunter River, as reported to the Water Users by State Water, are not caused by mining, there must be an embargo on all mining that seeks to interfere with the Hunter River and its tributaries and alluviums.	S3.8, 4.6
	<b>N6.21</b>	Water/ legislation	Concerned that there is no technical information or performance criteria for the barrier wall, or description of measures proposed to mitigate impacts arising from failure or compromise of the bentonite wall or levee. For this reason believe the EA does not meet requirements of the EP&A Act and must be resubmitted.	S3.5
	<b>N6.22</b>	Water	Believe success of the barrier wall has been grossly overestimated.	S3.5
	<b>N6.23</b>	Water	See N1.6. This should include data on current seepage rates, pump out rates from existing pits and piezo data for monitors near the existing wall. Previous audit reports and assessments of the barrier and levee must be provided.	S3.1, S3.5
	<b>N6.24</b>	Water	Submit that groundwater modelling in the EA is unreliable and needs to be assessed by an independent expert. Believe there is a serious discrepancy between predicted seepage into the pits and current pump-out. The predicted 0.48ML/day must be verified.	S3.1
	<b>N6.25</b>	Water	Geology of the Hunter Valley is complex and unpredictable and the assumptions made have too great a margin of error. The full extent of faults and fractures which transmit groundwater and their effects on the mine and water behaviour have not been adequately described.	S3.1, 3.5
	<b>N6.26</b>	Water	Must address what will be done if faults and fractures are unexpectedly encountered and the amount of seepage/ drawdown increases beyond that predicted. Mitigation and remediation measures in the EA are generally inadequate in scope and efficacy.	S3.7
	<b>N6.27</b>	Water	Must address the fact that there are no triggers in the water management plan for ceasing operations and remediation if and when serious damage is likely to occur.	S3.5, 3.7, 4.5
	<b>N6.28</b>	Water/ ecology	Opposes the proposed creek diversion/ interference with a natural water course. Artificial channels will not match the natural tributary in hydraulic, ecological and geomorphological values and will not behave in a manner to provide best environmental outcomes. The diversion process will disrupt the flow of aquatic organisms and will be unable to re-establish a vegetative cover that matches the original stream in a timely manner.	S4.3

**Table B.1 Summary of non-government organisation submissions and responses**

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>	
	<b>N6.29</b>	Ecology	A riparian or aquatic habitat assessment is needed for the unnamed tributary.	S11.1
	<b>N6.30</b>	Water	Open cut mining can impact quality and quantity of surface flows and allow sediment to enter the diversion channel, particularly during rainfall. The channel may receive more or less water as a result of the diversion. There is insufficient data provided about flow rates of the original stream and the proposed longer channel to give confidence that these unacceptable environmental impacts will not occur, particularly alteration to flow rates of the receiving Hunter River.	S4.3
	<b>N6.31</b>	Water/ legislation	The EA does not address the WM Act or Water Sharing Plans for Hunter River and Hunter Unregulated Streams and Alluviums. There is a risk the proposal will breach these.	S3.6
	<b>N6.32</b>	Water	Very saline water in the coal seam containing dissolved minerals may discharge into groundwater and detrimentally affect downstream watercourses. This danger is magnified in high rainfall if water storage is inadequate.	S3.3
	<b>N6.33</b>	Water	Further assessment is needed of the capacity of the evaporative sink to give complete protection against polluted run-off and seepage from hard rock aquifers entering the Hunter River.	S3.7, 3.8
	<b>N6.34</b>	Water	Long term groundwater sinks should not be established in the post mining landscape.	S3.1, 3.8
	<b>N6.35</b>	Water	Mine water seepage is not a legitimate use of a WAL Licence because State Metering Policy cannot be met, cease to pump orders cannot be followed, and reductions in entitlements cannot be regulated by the mine or enforced by the Government Department.	S3.6
	<b>N6.36</b>	Water	Mining related activities can crack surface water sources and their alluviums, which can significantly affect these water sources, water users and the environment. These impacts are likely to be exacerbated when the mine is close to or beneath third order or higher streams. Mining should be avoided when the mine is close to or beneath such streams.	S3.2
	<b>N6.37</b>	Water/ cumulative	The cumulative impact assessment in the Groundwater Report needs to address the future impacts of mining development beyond this extension.	S3.1
	<b>N6.38</b>	Water	Potential impacts to flood flows and floodplain behaviours have not been tested with any degree of reliability. Maps and diagrams do not show impacts upstream or downstream. A 1cm additional rise would mean a flood spreading over additional hectares off the mine lease.	S4.1, 4.2.4i, 4.2.4iii
	<b>N6.39</b>	Water	Flood behaviour must be modelled with more accuracy and the 1955 flood must be factored in, as in that year there were 2 to 2.5m of water over the mine site. A flood of this magnitude would be disastrous for the mine and environment.	S4.1, 4.2.4ii

**Table B.1 Summary of non-government organisation submissions and responses**

<b>Respondent</b>	<b>Issue</b>	<b>Addressed</b>
	<b>N6.40</b> Socio-economic	The economic costs of mining impacts have not been adequately considered. S12.1
	<b>N6.41</b> Socio-economic/ agriculture/ water	The Principle of Intergenerational Equity must be applied when considering the loss of prime agricultural land and its future potential for food creation. This is especially important as approval under Part 3A can be in effect for up to 20 years. Surface and groundwater resources which are relied upon to support the agricultural industry, provide drinking water and to sustain aquatic ecosystems must not be put at risk. S3.2, 4.2, 5.1, 5.3, 12.1, 13.8
	<b>N6.42</b> Socio-economic	The true cost of rehabilitation as well as the impacts to natural features and ecosystems as well as coexisting and surrounding land uses has not been adequately addressed. S12.1
	<b>N6.43</b> Socio-economic	Principles of ESD must be taken into account. S13.8
	<b>N6.44</b> Water	Mining puts pressure on surface and groundwater systems by competing with other water users and the environment. S3.4, 4.2
<b>N7</b> Hunter Valley Water Users Association	<b>N7.1</b> Socio-economic	Acknowledge the value of the coal industry to the Hunter Valley and NSW. S12.1
	<b>N7.2</b> Water	Raise the importance of surface and groundwater systems to the Hunter Valley. Believe water assets must be fully protected and any further mining expansion must not be allowed to put these assets at risk. S3.8, S12.1
	<b>N7.3</b> Agriculture	Believe there should be no further open cut mining of the rich alluvial flood plains of the Hunter River. S5.1
	<b>N7.4</b> Rehabilitation	Not convinced that the Class 1 & 2 soils can be restored to their previous productive condition. Restored land can support some crops but not at a sustainable and economical level. S6.1
	<b>N7.5</b> Water	Submit that the Hunter River must never be compromised by mining operations in close proximity. Destruction or damage to this river and its aquifers could never be rectified and would lead to untold environmental, social and economic losses to this region, the state and Australia. Similarly all due care must be taken to ensure that the river is not contaminated by mining. S3.2, 3.3, 4.2, 4.2.3, 4.5
	<b>N7.6</b> Water	Alluvial aquifers once destroyed cannot be replaced. S3.2
	<b>N7.7</b> Water	Concerned that the proposed flood levees have only been designed for the 1 in 100 year flood. Reference recent example in Qld where the flood that would never happen did happen, and another in Victoria where open cut mines became the bed of the river. S4.2.4iv
	<b>N7.8</b> Water	Submit that the proposed levy has the potential to raise flood levels down stream. Even if this is only a minor rise it can still cause serious damage to infrastructure and landowners. S4.2.4i

**Table B.1 Summary of non-government organisation submissions and responses**

Respondent		Issue	Addressed		
N8	Singleton Shire Healthy Environment Group	N7.9	Water	Not confident about effectiveness of the barrier wall currently constructed and proposed extensions to it. Has not seen any reports as to any leakages that may have occurred.	S3.5
		N7.10	Water	Do not completely understand possible ramifications of the proposed extension of the evaporative sink footprint.	S3.8
		N7.11	Cumulative	Believe there should be no further mine approvals in the Hunter until the cabinet committee announced by the premier to develop a whole of government approach to mining has reported.	S13.1
		N7.12	Water	See N2.1. This should be the minimum standard adopted.	S3.6
		N7.13	Cumulative	Cumulative impacts must also be considered.	S13.1
		N7.14	Socio-economic	Calls for the DoP to refuse the proposal or at least provide for a Planning and Assessment Commission of enquiry to examine the proposal.	S12.1
		N7.15	Air quality	Concerned about air quality.	S8.2
		N7.16	Noise and vibration	Concerned about noise.	S7.2
		N7.17	Ecology	Concerned about ecology.	S11.2.1
		N8.1	Health	The EA does not adequately and directly address the human health risk.	S9.3
		N8.2	Air quality	Believe the air quality of the Hunter Region is so bad that all additional industrial developments should be required to make no net increase in TSP or fine particulate matter PM <sub>2.5</sub> or less.	S8.4
		N8.3	Air quality	PM <sub>2.5</sub> monitoring should be required. Baseline data for future reference will be useful.	S8.3
		N8.4	Health/ air quality	Quote the Newcastle Morning Herald 'exposure to coal dust particulates can harm peoples' health even if the pollution is within state guidelines. Increased particulate exposure could cause deaths, require hospital admission and make children have more chest colds, nightly coughs and trips to the doctors.'	S9.1.1
		N8.5	Health/ air quality	Refer to their Submission dated November 2009 titled 'Is Air Quality Adversely Affecting the Health of Singleton Shire Residents? An urgent call for an independent scientific study to ascertain the relative health status of residents and the risk imposed by poor air quality' in which we predict similar outcomes (to Item N8.4) and draw attention to the present air quality of the Hunter Valley.	S9.2
		N8.6	Health/ air quality	The Director General's Requirements for all Air Quality and Health Risk Assessments should be based on no more than a 2.5ppm criteria.	S8.4

**Table B.1 Summary of non-government organisation submissions and responses**

Respondent			Issue	Addressed	
N9	NSW Farmers Association		<b>N8.7</b> Health/ cumulative	A health risk assessment should be undertaken and take into account cumulative effects.	S9.3
			<b>N8.8</b> Air quality	The proposal has the potential to increase fine particulates, which is unacceptable.	S8.2
			<b>N8.9</b> Health/ air quality	Demand an independent investigation of the health of Singleton residents and the link to particulate and air toxics. Do not accept the Regional Air Monitoring Network as a substitute for health assessment which goes beyond those implicit in the NEPM standards.	S9.2
			<b>N8.10</b> Cumulative	See N6.10	S13.1
			<b>N8.11</b> Air quality/ cumulative	The EA is unclear as to the method of cumulative assessment used eg. what other local sources of dust were included in their monitoring. The data presented is misleading especially for background level, and cumulative impact of other large adjoining mines is not convincingly dealt with.	S8.1.4
			<b>N8.12</b> Air quality	The EA recognised that the chemical composition of the dust is as important as fraction size but make no commitment to assess the dust for its chemical composition.	S8.1.3
			<b>N8.13</b> Air quality	The EA does not provide details of how blasting impacts were included in the modeling.	S8.1.2
			<b>N8.14</b> Air quality	The EA does not state what the dust controls to be implemented are.	S8.3
			<b>N8.15</b> Air quality	Too great a reliance is placed on Zones of Acquisition to address dust impacts. This does not address concerns of the wider community.	S8.3
			<b>N9.1</b> Water	The impacts of the proposal on aquifers and water resources have not been adequately researched.	S3.1, 4.1
			<b>N9.2</b> Water	Insufficient information has been provided to assess the likely effectiveness of risk management measures.	S3.1, 3.7
			<b>N9.3</b> Agriculture	Valuable agricultural land will be permanently destroyed.	S5.1
			<b>N9.4</b> Cumulative	There has been no attempt to assess and address cumulative impacts.	S13.1
			<b>N9.5</b> Water	Quote 'Seepage into the Cheshunt Pit is predicted to range from 0.7 ML/day to 7.3 ML/day...(p203)'. Submits that this statement from the EIS is representative of the generally vague and inadequate approach to hydrogeological impact assessment. The EIS does not clearly state where the seepage will be coming from. The consultants have made a cursory desktop study, relying on old data which has little or no relevance to the site.	S3.1
			<b>N9.6</b> Water	It is likely that the mine will cause permanent damage to the hydrogeological system leading to loss of water from the Hunter River and contamination of ground and surface water.	S3.2, 3.3, 3.4, 4.2, 4.2.3

**Table B.1 Summary of non-government organisation submissions and responses**

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>	
	<b>N9.7</b>	Water	Detailed three dimensional study of the specific hydrogeology is required.	S3.1
	<b>N9.8</b>	Water	Paucity of information regarding the mitigation measures and lack of scientific support for their adequacy. No information is given on the time scale of effectiveness for the barrier wall or measures to assess and ensure its long term effectiveness. It could fail.	S3.5
	<b>N9.9</b>	Water	See N2.1. The EIS is silent on this matter.	S3.6
	<b>N9.10</b>	Air quality	Treatment of dust impacts is inadequate. Quotes 'Some residences in the Warkworth Village area are also predicted to experience 24-hour PM <sub>10</sub> levels above the DECC's 50µg/m <sup>3</sup> 24-hour assessment criterion. The air quality impact assessment predicts that some residences in the Western Dieu area will experience some exceedances of the DECC's 50µg/m <sup>3</sup> 24-hour assessment criterion due to emissions from HVO South alone. These will need to be managed via the real-time monitoring and air quality management system (page 182)'. A 24hour assessment averages dust levels over the period and disguises the intensity of events.	S8.1.3
	<b>N9.11</b>	Air quality	There is no detail regarding the air quality management system referred to.	S8.3
	<b>N9.12</b>	Noise and vibration/ air quality	Permitted noise and dust levels are routinely exceeded in the area with no enforcement action by government.	S7.6, 8.4
	<b>N9.13</b>	Health/ air quality	Aggravation of health impacts caused by air pollution from existing mines.	S9.1.1
	<b>N9.14</b>	Rehabilitation	The DoP should commission detailed assessment of the past success of rehabilitation on similar lands.	S6.2
	<b>N9.15</b>	Rehabilitation	Believe it is impossible to rehabilitate aquifers and certain soil types to their former state and productivity.	S3.2, 6.1
	<b>N9.16</b>	Agriculture	Object to mining of excellent alluvial land with reliable water supply.	S5.1
	<b>N9.17</b>	Agriculture/ cumulative	The once productive agricultural enterprises have been driven from the area by existing mining.	S5.1, 13.1
	<b>N9.18</b>	Rehabilitation	Mining industry approach to rehabilitation is to pile undifferentiated mine spoil into the pit, replace some topsoil and throw money at achieving cosmetic regrowth. Unaware of any crops that have been produced profitably on such land.	S6.1, 6.2
	<b>N9.19</b>	Cumulative	The EIS does not address the cumulative impacts of existing mining activity and projects which have been	S13.1

**Table B.1** Summary of non-government organisation submissions and responses

Respondent	Issue		Addressed
N10 Construction, Forestry, Energy and Mining Union	N9.20	Legislation	approved and not yet commenced. It avoids the question of how much more mining the ecosystem and people living in it can be reasonably expected to tolerate.
	N9.21	Water/legislation	Call for general reforms to mining approval which involve upfront strategic approval and formal cumulative impact assessment at landscape/ catchment scale.
	N9.21	Water/legislation	The proposal should be independently assessed for Aquifer Interference Approval by the Office of Water under clause 91(c) of the WM Act 2000. Part 3A is inadequate to allow this.
	N10.1	Support	In balance supports the application.



## Appendix C

### Government submissions

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**Table C.1** Summary of government submissions and responses

Respondent		Issue			Addressed
G1	DECCW	G1.1	Air quality	Wheel generated dust emissions are under estimated as the average vehicle weight travelling on haul roads was under estimated for some haul roads and the latest estimation technique from the US EPA AP42 was not used. This would potentially increase incremental and cumulative TSP and PM <sub>10</sub> , particularly maximum PM <sub>10</sub> concentrations.	S8.1.5
		G1.2	Air quality	Request details of all site specific factors which may influence wheel generated dust emission rates such as speed limits.	S8.1.5
		G1.3	Air quality	Recommend remodelling is performed using revised emission estimates and cumulative impact assessment is presented for 24 hour maximum PM <sub>10</sub> , in accordance with the Approved Methods.	S8.1.5
		G1.4	Air quality	Recommend a review of sources and emission controls is undertaken to demonstrate that controls are in line with best practice management.	S8.1.5
		G1.5	Air quality	Recommend a condition of approval be included that prior to commencement of the Project, the Proponent shall provide an updated Air Quality impact Assessment, that addresses the points listed above in G1.1 to G1.4.	S8.1.5
		G1.6	Air quality	GHG emissions have been estimated using appropriate methodology and no specific recommended conditions of approval are proposed relating to GHG emissions for the proposal.	S13.3
		G1.7	Noise and vibration	DECCW is not aware of any industry wide acceptance of ENM over-prediction under the stated conditions.	S7.1
		G1.8	Noise and vibration	Recommend that any change to noise limits in the consent should not be agreed to at this time. DECCW does not propose any amendment to the existing consent in relation to noise.	S7.6
		G1.9	Noise and vibration	DECCW supports the proponent's commitments to real time directional monitoring at Jerrys Plains, reactive management and research and development on predictive weather forecasts as a management tool, as well as other initiatives that may be adopted to ensure mining practices do not result in exceedances of consented noise limits.	S7.4
		G1.10	Noise and vibration	Advise that noise limits in the existing DA450-10-2003 and Project Approval MP06_0261 are not directly transferrable to the existing EPL. Prior to development for noise limits in EPL640, if proposed, a cumulative analysis of respective limits in each project approval will be required.	Noted
		G1.11	Water	A revised site water balance has not been provided in the EA to demonstrate that the mine can operate within the constraints imposed by the HRSTS. The proposal will be required to operate within the parameters of the HRSTS.	S4.2.3
		G1.12	Water	DECCW does not propose any specific recommended conditions of approval relating to water quality.	Noted
		G1.13	Ecology	DECCW cannot confirm the ecological survey effort is adequate and in accordance with DECCW guidelines. Details such as the time, date, distance/ area over which searches and surveys were undertaken as well as targeted species survey techniques have not been provided.	S11.1

Table C.1 Summary of government submissions and responses

Respondent	Issue		Addressed
<b>G1.14</b>	Ecology	DECCW is in agreeance with the EA conclusions that the proposal would have a significant impact on the Tiger Orchid but would not have a significant impact on the Hunter Valley <i>Eucalyptus camaldulensis</i> endangered population or the Pine Donkey Orchid. Agrees that offsets are not required for the <i>E. camaldulensis</i> or Pine Donkey Orchid.	S11.3.1
<b>G1.15</b>	Ecology	Believe a biodiversity offset is needed for Central Hunter Box - Ironbark Woodland EEC and Tiger Orchid, should the proposed translocation be unsuccessful. This should be prepared in accordance with the DECCW (2008) Principles for the use of Biodiversity offsets in NSW and include details of the mechanism(s) to be used to ensure the offset is secured in perpetuity.	S11.3.1
<b>G1.16</b>	Ecology	It is not clear if the rehabilitated woodland will aim to re-establish the Central Hunter Box - Ironbark Woodland EEC and if this rehabilitation project is additional to, or part of any rehabilitation requirements of the I&INSW.	S11.3.2
<b>G1.17</b>	Ecology	Not clear if the River Red Gum Rehabilitation and Restoration Strategy is in addition to I&I NSW requirements.	S11.2.3iii
<b>G1.18</b>	Heritage	Submits that at least one of the reports used to inform the EA, ie MCH 2009, uses a site classification definition that is inconsistent with that set by DECCW, ie 'an artefact scatter is a site with a maximum density equal to or greater than 5 artefacts per square metre. Anything less is an isolated artefact/s'. In NSW an isolated find is defined as 'single object identified within a 50m radius', while an artefact scatter is 'two or more objects identified within a 50m radius'. The appropriate classification must be reported to ensure the assessment of significance and potential impact has been reliably documented. It is also essential to ensure the local Aboriginal community has been provided with accurate information. DECCW recommends the proponent ensure these sites are updated to reflect accepted standard of identification of an isolated find and artefact scatter.	S10.1.1
<b>G1.19</b>	Heritage	The proponent must provide DECCW with a comprehensive list of past reports submitted within the North East Region using any definition of an isolated artefact other than the accepted DECCW definition, so the appropriate notation can appear on site cards and catalogued reports.	S10.1.1
<b>G1.20</b>	Heritage	Submits that the proposal is being assessed under Section 75W of the EP&A Act and approvals under S90 of the EP&A Act are therefore not required. Concerned this has not been cleared outlined during the Aboriginal consultation. Accordingly, DECCW recommends that any modified consent should reflect the local Aboriginal community's expectations of subsequent opportunities for involvement in negotiating methods to appropriately manage any likely cultural heritage impact from the proposal.	S10.2.1
<b>G1.21</b>	Heritage	The EA states that a key management protocol from the ACHMP is the CHIMA, which provides management specific to CM-CD1. DECCW notes that the level of harm proposed for CM-CD1 (currently managed as an exclusion zone) is total destruction. The current consent addresses management of CM-CD1 and recommends consideration be given to a	S10.2.2

Table C.1 Summary of government submissions and responses

Respondent	Issue		Addressed
		permanent conservation status for it. If conservation and avoidance of this area is no longer a focus of the ACHMP and consent, these need to reflect this change. The EA does not provide any evidence of support for this change in management. DECCW recommends evidence of support for this proposal is provided from the registered local Aboriginal stakeholders and an additional section of the ACHMP is drafted to reflect the different planning processes for each portion of the development.	
	<b>G1.22</b> Heritage	DECCW notes that Aboriginal community consultation as part of CHWG meetings can be effective, but not in isolation. This process requires communication that is clear and transparent and provides those involved with a fair and equitable opportunity to be informed. It appears that attendees of the CHWG meetings were not always adequately informed of the proposal. Raises concerns that there is a 'considerable degree of confusion' by the Aboriginal community as a result of the communication techniques used.	S10.1.2
	<b>G1.23</b> Heritage	It is essential that the requirements for best practice in cultural heritage management and regulatory control expected from the AHIP process is included in any consent condition of approval. Recommend DoP ensure the consent, if modified, includes conditions that enable the registered aboriginal parties to have an opportunity to engage in the development implementation and monitoring of Aboriginal cultural heritage through a revisited ACHMP process.	S10.2.1
	<b>G1.24</b> Heritage	Five of the Aboriginal sites to be impacted were to be excluded from mining in the existing development consent, with consideration given to permanent conservation status. These conditions require the Director General be notified within 14 days of such an agreement being finalised. DECCW understands this has not occurred. The only proposed management strategy is to salvage the remaining surface artefacts.	S10.2.2
	<b>G1.25</b> Heritage	Highlights the cultural significance and rarity of CM-CD1. The documentation indicates the community required a significant offset for its destruction.	S10.2.3
	<b>G1.26</b> Heritage	DECCW is concerned about the proposed management strategy and lack of support. Believes a more appropriate management strategy is required, including a comprehensive program of archaeological salvage of the CM-CD1, CM1 and CM2 complexes by the proponent prior to any development in this area.	S10.2.3
	<b>G1.27</b> Heritage	It is highly likely that additional objects would be encountered at depth at the locations where the four additional sites were identified, as well as under vegetation, particularly in proximity to the CM-CD1, CM1 and CM2 and the recent finds.	S10.2.5
	<b>G1.28</b> Heritage	Concerned that the cultural heritage management of the proposal may result in an unmanageable volume of objects being stored under the interim agreement (Care Agreement #2863), which is now valid until 2013. Recommends the care of any Aboriginal heritage objects recovered under this modification be revisited in consultation with the community, with priority given to their long term management. Temporary management options need to ensure the	S10.2.4

**Table C.1** Summary of government submissions and responses

Respondent	Issue		Addressed
		stored objects are accessible to the Aboriginal and research community as deemed appropriate by the CHWG in cooperation with the proponent.	
	<b>G1.29</b> Heritage	The DECCW provided recommended conditions of approval in relation to Aboriginal cultural heritage.	S10.3
	<b>G1.30</b> Waste	Waste has not been fully assessed in accordance with the DGRs and is not considered in any detail in the EA. Accordingly DECCW is unable to determine recommended conditions of approval for the proposal.	S13.10
<b>G2</b> Singleton Council	<b>G2.1</b> Water	Supports the guideline - Management of Stream/ Aquifer System in Coal Mining Development - Hunter Region and its application to the proposal.	S3.6
	<b>G2.2</b> Rehabilitation	The existing levee should be removed and the alluvial lands rehabilitated prior to the extension commencing to prove the proponent can return the environment back to a satisfactory pre-mining state.	S6.1
	<b>G2.3</b> Water	Even with the proposed barrier wall there will be a water loss. This impact should be regularly monitored and the results reported to the community.	S3.5, 3.7, 4.5
	<b>G2.4</b> Water	A groundwater monitoring regime is proposed and will need to be strictly regulated to ensure there are no adverse impacts of mining on the Hunter River and its alluviums.	S3.7
	<b>G2.5</b> Acquisition	Ensure the Moses property retains the right to acquisition upon request.	S13.9
	<b>G2.6</b> Noise and vibration	Consideration should be given to limiting night time mining operations - the risk of audible noise and exceedances of criteria limits is greatest at this time, which would be of particular concern for Jerrys Plains.	S7.4
	<b>G2.7</b> Air quality	Ensure appropriate air quality monitoring continues at Jerrys Plains and other sensitive receptors.	S8.3
	<b>G2.8</b> Visual	All mine-related lighting should be positioned to minimise light spill and glare when viewed from external vantage points.	S13.2
	<b>G2.9</b> Rehabilitation	Site rehabilitation should provide a balance between ensuring the reinstatement and ongoing sustainability of agricultural land uses and re-establishment of woodland areas.	S6.4
	<b>G2.10</b> Rehabilitation/ agriculture	The rehabilitated land should include irrigated pastures. In this regard concern is expressed with the extent and depth of topsoil and supporting soil structure to be reinstated. In some areas it seems there is proposed to be less than 1m depth which does not seem adequate.	S6.3, 6.4
	<b>G2.11</b> Traffic	Whilst not directly related to this proposal, the upgrade of the Golden Highway and Lemington Road intersection should be completed in a timely manner.	S13.4
	<b>G2.12</b> Socio-economic	Notes that there is no specific commitment in relation to community benefits other than those derived from economic benefits.	S12.3

**Table C.1** Summary of government submissions and responses

<b>Respondent</b>	<b>Issue</b>		<b>Addressed</b>
<b>G2.13</b>	Socio-economic	Request that the DoP establish a mechanism to facilitate a community enhancement offset in respect of the village of Jerrys Plains.	S12.3
<b>G2.14</b>	Socio-economic/ water	Submits that the DoP assessment process must carefully consider the net economic benefit of mining versus the risk to the environment and in particular the Hunter River and connected alluviums.	S12.1
<b>G2.15</b>	Water	Mining operations will need to be tightly managed and rigorously monitored to ensure the Hunter River and connected alluviums are not adversely impacted.	S3.2, 3.7, 4.2, 4.5

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## Appendix D

### Response to I&I NSW submission

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## D.1 Introduction

This appendix provides a response to the submission by I&I NSW, lodged on 13 December 2010. In instances where matters raised have been addressed in the main report, a cross reference is used.

## D.2 Coal title

It was submitted that the Proponent's application to the Minister for Primary Industries for consent to apply for a mining lease over the whole project area is still pending and the Proponent does not currently hold a coal title over part of the proposed extension area. As such, the Proponent has not fully assessed the coal resources in the area.

The part of the mining lease application in question is the area in which the proposed barrier wall and levee are located. These structures are positioned to the south of existing tenements and no mining is intended beneath these areas. This is to enable maximise resource recovery within existing tenements.

Coal & Allied will continue its engagement with I&I NSW in relation to the mining lease application matter.

## D.3 Groundwater

The I&I NSW submission raised several matters related to groundwater. These are presented in italics following, with a response provided beneath each comment.

*The submission raises that due to the stated poor quality of groundwater, it must managed so that it does not enter the surface water system, i.e. be used for dust suppression or irrigation.*

Saline groundwater from the proposal will be incorporated into the existing mine water management system. Sections 3.3, 3.8 and 4.2.3 of the main report address submissions related to water quality.

*The submission raises that groundwater quality must be variable as there are licensed users to the west and south of the Carrington West Wing site. This again highlights the inadequacy of the EA groundwater coverage.*

Matters associated with the impacts and management of groundwater are within the jurisdiction of NOW.

Section 3.1 of the main report provides a response to comments raised regarding the approach to the groundwater assessment and the rigour of the results reported in the EA.

In summary, the groundwater model utilised in the assessment of potential groundwater impacts has been developed over many years and has successfully predicted impacts of mining since the commencement of the first slot at Carrington in 2000. The model was carefully calibrated, using an extensive database from more piezometers than any other mining project that MER is aware of in the Upper Hunter. Monitoring undertaken across the Carrington area has verified modelling predictions from previous impact assessments, providing confidence in the predictions presented in the EA.

As reported in Section 5.2.2iv of the EA, there are no identified private boreholes or wells within the predicted zone of depressurisation and dewatering. The nearest boreholes are located about 2.5km to the south and are constructed in shallow alluvium.

*The submission raises that potential impacts to agriculturists might be the effects upon other aquifers being utilised for irrigation purposes, i.e. depletion or alteration of water levels and resultant increased pumping costs.*

As reported in the response immediately above, there are no identified private boreholes or wells within the predicted zone of depressurisation and dewatering.

Potential impacts to Hunter River base flows are discussed in Section 3.4 of the main report. The seepage rate from depressurisation is not expected to increase beyond the maximum rates for the existing pit.

*The submission raises NOW's concerns over the adequacy of groundwater assessment in this proposal.*

The groundwater assessment in the EA has been prepared by a leading groundwater expert in NSW. It was submitted for adequacy review prior to exhibition. The Proponent is not aware of any concerns from NOW in relation to the adequacy of the groundwater assessment and note that the DoP will be engaging an independent review of the groundwater assessment.

*The submission states that the proposal is not consistent with NOW'S guideline 'Management of Stream Aquifer Systems in Coal Mining Developments - Hunter Region'.*

Refer to Section 3.6 of the main report for a response to this matter.

## D.4 Agriculture

The I&I NSW's submission raised several matters related to agriculture. These are presented in italics following, with a response provided beneath each comment.

*The submission references the agricultural suitability classification of the proposed extension area contained within the EA and reasserts that it is considered prime agricultural land.*

Section 5.4 of the EA describes the existing environment, including identification of the areas of Class 2 and 3 agricultural land located within the proposed extension area, assesses potential impacts of the proposal on these areas and provides mitigation and monitoring measures to manage the potential impacts.

As further reported in Section 5.4, the Proponent has made the significant commitment to rehabilitate Class 2 and 3 lands (in terms of agricultural suitability) back to Class 2 and 3 land post-mining (refer to Table 5.7 of the EA).

*The submission questions the Proponent's ability to increase the area of Class II rural land capability land and maintain Class II and Class III rural land capability lands post rehabilitation.*

The EA has assessed the areas within the proposed extension area as comprising 65.0ha of Land Suitability Class II lands. Significantly, the proponent has committed to rehabilitating 65.0ha of land back to Land Suitability Class II land following the completion of mining. Further, the Proponent has committed to increasing the area classified as Class III land from 44.0ha prior to mining, to 64.6ha following mining (refer to Table 5.5 within the EA). The Proponent's experience in successful rehabilitation of Class II lands is provided in Chapters 5 and 6 of the main report.

*The submission refers to the Brown Uniform Silty Clay Loam section of the site comprising 32% or 43.9ha of the proposed extension area. The EA states that 1.2m of this soil is suitable for stripping and reuse as a*

*topdressing medium. This confirms opinions that the site comprises Land Suitability Class II lands, which are extremely valuable agriculturally.*

Refer to the sections immediately above and Chapter 6 of the main report for a response to this matter.

*Objects to the reported 26.63% decrease in Class III land at the proposed out of pit overburden emplacement area.*

As described in Section 3.2.1 of the EA, the out-of-pit overburden emplacement areas are proposed on rehabilitated land immediately north of the proposed extension area. To achieve the rehabilitation goal of post-mining landform and land capability class in the proposed extension area being similar to pre-mining (refer to Section 3.2.1 and Figure 3.1 of the EA), emplacing overburden above the pre-mining elevation on the proposed extension area was discounted in preference of returning these lands to similar grade. The additional material from this area needs to be disposed. It was considered that overburden emplacement cannot be accommodated at other locations due to limitations in emplacement capacity and consented height limits. Accordingly, as described in Section 3.2.1 of the EA, the out-of-pit overburden emplacement areas are proposed on rehabilitated land immediately north of the proposed extension area.

As described in the Carrington Mine EIS, prepared by ERM Mitchell McCotter in 1999, prior to mining, the proposed out-of-pit emplacement areas comprised Class IV land. As such, the land class proposed for the out-of-pit emplacement areas is of a higher quality than its original pre-mining condition.

As detailed in Section 3.2.3 of the EA, the proposed rehabilitation strategy includes restoration of both agricultural and biodiversity values of the land. Accordingly, in addition to the proposed agricultural land uses, considerable portions of the proposed out-of-pit overburden emplacement areas are proposed to be rehabilitated with woodland.

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