

Mount Thorley Continuation Project Review Report

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Warkworth Continuation Project PAC Review Report©
State of New South Wales through the NSW Planning Assessment Commission, March 2015.

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Executive Summary

The Planning Assessment Commission (the Commission) has been directed to review the Mount Thorley Continuation Project to assess the merits of the project as a whole, paying particular attention to the potential amenity, health and social impacts on the village of Bulga and surrounds. The Commission has been directed to apply all relevant NSW Government policies in its considerations and to its assessment, and to provide recommendations on any reasonable and feasible measures to avoid, reduce and / or offset the potential impacts of the project.

The Commission to undertake the review was constituted by Mr Paul Forward (Chair), with Ms Lynelle Briggs AO and Mr Gordon Kirkby.

The Mount Thorley Continuation Project involves the continuation of the existing open cut mining operations from Loders Pit and Abby Green North Pit at a rate of up to 10 Mtpa of run-of-min (ROM) coal. Extraction of this resource is expected to continue until 2022, however a 21 year consent period is sought to enable the ongoing provision of services to Warkworth mine. These services are considered critical to the viability of the Warkworth mine and rehabilitation of both mines, and include equipment, personnel, overburden transfer, water, coal rejects and coal preparation.

In addition, the Applicant is seeking the following changes to the existing Mount Thorley consent:

- Upgrade of the Mount Thorley Coal Preparation Plant to facilitate an increased maximum throughput of 18 Mtpa of ROM coal
- Transfer of overburden between Mt Thorley and Warkworth mines to assist in the rehabilitation and final landform design of the Mount Thorley Warkworth (MTW) complex
- Upgrade of the MTW integrated water and tailings management systems.

The Commission held a Public Hearing on the project on the 18 and 19 December 2014 at the Singleton Heights Diggers Club. The Commission heard arguments both for and against the project.

The Commission has given detailed consideration to the issues raised in submissions and at the Public Hearing. It is aware of the significant history of the project particularly in relation to the 1996 approval and Deed of Agreement and the Land and Environment Court (LEC) judgment in relation to the previous Warkworth Extension Project (incorporating Mount Thorley). It also notes changes to government policy and legislation in relation to mining assessments and biodiversity offsetting policy that have occurred since refusal of the previous application by the LEC.

Economic impacts

The Commission notes that the Mount Thorley Continuation Project will result in economic benefits to both the State and the region. In summary these benefits include:

- Continued extraction of coal from the already approved operations to ensure an additional 29 million tonnes of coal
- Net capital expenditure with a net present value (NPV) of \$4 million
- The continuation of approximately 120 jobs for an additional 11 years
- The payment of \$50 million in royalties in NPV terms to the State.

While these benefits on their own are not significant, the Commission notes that together with the Warkworth Continuation Project, the Mount Thorley project would have significant economic

benefits. These include approximately \$1,488 million in net economic benefit, provision of continued employment for up to 1,300 workers and the generation of royalties to the State in the order of \$617 million. The Commission also notes that the Warkworth Continuation Project is dependent on approval of the Mount Thorley Continuation Project.

Notwithstanding the economic benefits of the project, the Commission also recognises that the project will result in adverse economic impacts, particularly on the Bulga village and its residents. Specifically these impacts are likely to include impacts on property values and on the ability of residents to be able to sell their properties in the future. In light of these impacts (and other environmental concerns, including notably noise and dust impacts), the Commission is of the view that consideration should be given to options to ameliorate this impact. Options recommended by the Commission for consideration include compensating property owners for actual loss in property values, or relocating the village, or developing an enhancement strategy for the village and undertaking a program of works to benefit the village and its surrounds. The Commission considers that the unique and unusual set of circumstances that apply in this case warrants serious consideration of these options.

Social impacts

Concerns have been raised that the project will result in significant adverse social impacts. The Commission agrees that although the existing mining complex, along with the other mines in the area, has positive impacts (in particular in terms of employment in the community as a whole), it also has negative social impacts on the local community and in this case particularly the Bulga community. The positive and negative impacts can reasonably be expected to continue for the life of the project.

In balancing the social impacts against the economic benefits associated with the proposal, the Commission has formed the view that the impacts expected as a result of the project are acceptable when compared to the standards and performance measures commonly applied to mining projects in NSW. The continuation of operations and associated employment of approximately 1,300 employees will contribute to the vitality of centres such as Singleton, as well as a continued demand for community services and infrastructure in the area. It does however consider that options exist to ameliorate the impacts of the project on the Bulga community and recommends that consideration be given to them.

Noise

One of the key environmental issues raised in the Public Hearing and public submissions regarding the project is noise impacts. The Commission notes that noise is a long-standing issue between the MTW mine complex and the Bulga community. In this regard the Commission concludes that the evidence indicates:

- The relationship between the Applicant and the Bulga community has deteriorated to the level where constructive discussion to resolve issues of significant concern to the community is difficult, particularly in terms of monitoring and compliance
- There is confusion and misunderstanding in the community in relation to the application of the Industrial Noise Policy (INP), the purposes of different types of monitoring and validity of these results for non-compliance prosecution, and the trigger action response process, particularly whether the trigger level is set at or below the noise limit
- The Applicant has not demonstrated it is able to counter the community's scepticism and lack of confidence in its ability to comply with the existing and proposed noise criteria if the project is to be approved.

The Commission considers it is of critical importance that the Applicant attempt seriously to improve its relationship with the community so as to rebuild confidence and trust. Engaging an independent mediator may assist in this rebuilding process. Further, as a first step towards reconciliation, it considers that the Applicant should genuinely commit to honouring the acquisition and mitigation rights provided to the residences under the now repealed Warkworth Extension Project approval.

The Commission considers that many issues raised in relation to noise are broad issues relating to the INP (i.e. acceptability and appropriateness of criteria, low frequency noise, monitoring and compliance) and should be canvassed in a review of the INP.

Other findings of the Commission in relation to noise include:

- The noise issues raised in the LEC judgment have been addressed adequately based on the totality of evidence before the Commission
- The data collection, analysis and assessment of the background noise levels for the Bulga area are consistent with the INP requirements
- The noise criteria in the draft conditions take into account the Mining SEPP and the Voluntary Land Acquisition and Mitigation Policy
- Predicted noise exceedances have been dealt with in accordance with the Mining SEPP and the Voluntary Land Acquisition and Mitigation Policy
- The unintended consequence of the 2013 LEC judgment is a significant reduction in the number of properties that will be provided with mitigation or acquisition rights, if the subject application is approved
- The commencement of any new consent should trigger the application of the new noise criteria
- The 2012 SKM monitoring report found the mine generally complied with its current noise limits, noting that some locations may be affected by low frequency noise
- Low frequency noise is a significant issue to the community. The INP methodology should apply and not other alternative methods. During compliance testing, if low frequency noise is prevalent, an appropriate noise modification factor should apply before comparison with the noise criteria if the approval is made
- Other noise issues including sleep disturbance, vibration, health impact, traffic noise and rail noise have been addressed adequately in the EIS, Noise and Vibration Study and the Secretary's assessment report.

Having regard to these findings, the Commission's recommendations (included in the body of the Review report), advice from the EPA and the draft recommended conditions, the Commission considers that the issue of noise has been adequately assessed.

Visual impacts

The project also gives rise to significant concerns in relation to visual impact, particularly the visual impacts of the mine expansion on Bulga village given the proposed removal of Saddleback Ridge, which currently acts as an important visual barrier between a number of residences and the mine. While the Commission recognises that Saddleback Ridge does not strictly form part of the Mount Thorley operations, the Mount Thorley and Warkworth mines are integrated in terms of infrastructure and rehabilitation. Therefore, the visual impact assessment has considered the mining complex as a whole.

The Commission has considered the Visual Impact Assessment accompanying the Mount Thorley EIS, ownership status of the land, the proposed mitigation measures and draft recommended conditions

in detail. On balance, it has concluded that although the landscape in and around the mining complex would be altered as a result of the project, the visual impact would either be acceptable or could be minimised by the proposed mitigation measures and draft recommended conditions. However, the Commission acknowledges that the local community of Bulga may view this as a subjective judgement.

Air Quality

Air quality has been raised as a concern, particularly in relation to the potential health impacts of the project, increased dust levels at nearby residences and cumulative air quality impacts from mining in the Hunter Valley.

In relation to air quality, the Commission notes that the air quality modelling generally indicates that the proposal will comply with relevant criteria, with the exception of annual average 24-hour PM₁₀ at three privately owned locations, all of which are in Warkworth Village. The two privately owned residences are recommended for acquisition under the concurrent Warkworth Continuation Project. This is considered appropriate.

The Commission notes that in terms of human health, PM₁₀ and PM_{2.5} have the potential to give rise to adverse health effects and that particles larger than 10 micrometres are essentially prevented from entering the human respiratory system due to their size. PM_{2.5} particles are of most concern in terms of health effects as they penetrate deeper into the respiratory system than larger particles and because they are generally created by combustion of fuels or by chemical reactions. Deposited dust, whilst not resulting generally in health impacts, can cause nuisance impacts. The Commission, as advised by the EPA, understands that the proposed mitigation measures (including 'active' mitigation measures such as real-time dust monitoring and meteorological forecasting to guide the day to day planning of mining operations) incorporated into the project to minimise air quality impacts represent 'best practice measures'. Further, a comprehensive Air Quality Management Plan will also be required to be prepared to inform the operation of the mine and manage potential exceedances. Having regard to all these measures, the Commission considers that as far as practicable all possible measures will be taken to minimise exposure to PM as a result of the project.

The Commission is, therefore, generally of the view that the proposal is likely to be acceptable in terms of air quality impacts, however recommends minor amendments to proposed conditions of consent.

Rehabilitation

In relation to rehabilitation, the Commission has heard concerns that the Applicant has a poor track record of mine rehabilitation and that it is not possible to be confident that the rehabilitation proposed as part of the current application will be undertaken in a timely manner and to an acceptable standard. Concerns have also been raised that rehabilitation of post-mined land is proposed to be included in biodiversity offsets.

The Commission is satisfied that, subject to draft recommended conditions, rehabilitation of the site will be undertaken in a timely manner and to an acceptable standard. In respect of the proposed biodiversity offsetting of post mined rehabilitated land, the Commission accepts that this is consistent with existing government policy and that adequate safeguards are proposed to ensure only land rehabilitated to an acceptable standard is used for offsetting and that if rehabilitated land does not meet this standard, other means will be used to retire the required biodiversity credits.

Other issues

Other issues considered in detail in the attached report include impacts on traffic and transport, Aboriginal archaeology and water resources.

Conclusion

In conclusion, the Commission has made a number of significant recommendations and requires further information on a variety of matters prior to determination of the subject application. The Commission notes that whilst the current application is very similar to the Mount Thorley part of the previous Warkworth Extension Project (that was refused by the LEC) significant legislative and policy changes have occurred since that time. The Commission is required to consider the current legislative and policy environment in its review of the application. Further, changes have been made to the application to address issues raised in the LEC decision.

The Commission recognises that the project (in conjunction with the Warkworth Continuation Project) provides for mining of a major resource and will have very significant direct and indirect economic and social benefits for the State and the Hunter region. It also acknowledges that if the projects were not approved, there would be substantial adverse economic impacts especially to the towns of Singleton and Cessnock. These impacts include the loss of royalties to the NSW government, a reduction in infrastructure projects to the Hunter region and lower wage and salary income for both current employees and contractors.

In terms of environmental impacts, the Commission has concluded that the impacts of the project are acceptable subject to additional information as detailed herein and the imposition of stringent conditions of approval.

In summary the Commission considers that the project is consistent with government policy and legislation and is capable of being approved.

Table of Contents

Executive Summary	i
Glossary	viii
1. Introduction	1
1.1 Description of mines	1
1.2 Surrounding area	2
2. Background	6
2.1 1996 and 2012 Approvals	6
2.2 Land and Environment Court Appeal	7
2.3 Changes to legislation and government policy	8
2.3.1 Mining SEPP	8
2.3.2 Biodiversity Offsets Policy	8
2.3.3 Voluntary Land Acquisition and Mitigation Policy	9
3. Current Applications	10
3.1 Mount Thorley Continuation Project	10
3.2 Warkworth Continuation Project	11
3.3 The Secretary's Assessment Report	11
4. The Commission's Process	13
4.1 Terms of reference for the Review	13
4.2 Public Hearing and submissions	13
4.3 Documents, meetings and site inspections	15
4.3.1 Documents	15
4.3.2 Meetings and site inspections	16
4.4 Process from here	16
5. Consideration of Key Issues	17
5.1 Economic Impacts and Benefits	17
5.1.1 Significance of the resource	17
5.1.2 Economic study and cost benefit analysis	18
5.1.3 Economic impacts to Bulga village	20
5.1.4 Summary	22
5.2 Social Impacts	23
5.2.1 Social benefits and impacts of the proposal	23
5.2.2 Department's position	26
5.2.3 Commission's position	26
5.2.4 Summary	26
5.3 Noise impacts	27
5.3.1 Introduction	27
5.3.2 Issues raised in Public Hearing and public submissions	28
5.3.3 Noise matters raised in LEC judgment	29
5.3.4 Existing and background noise levels	29
5.3.5 Noise criteria	33
5.3.6 Exceedances of noise criteria	34
5.3.7 Noise management measures	35
5.3.8 Noise monitoring and compliance	37
5.3.9 Low frequency noise	39

5.3.10 Blasting	40
5.3.11 Summary	40
5.4 Visual impacts	42
5.4.1 Introduction	42
5.4.2 Existing visual landscape	42
5.4.3 Expected visual impacts	43
5.4.4 Mitigation measures	43
5.4.5 Department's position	44
5.4.6 Summary	46
5.5 Air quality	46
5.5.1 Introduction	46
5.5.2 Proposal	46
5.5.3 Modelling results	47
5.5.4 Health impacts	49
5.5.5 Draft recommended conditions	49
5.5.6 Summary	50
5.6 Rehabilitation	50
5.6.1 Introduction	50
5.6.2 Applicant's track record in rehabilitation	50
5.6.3 Offsetting of rehabilitation mine land	51
5.6.4 Summary	52
5.7 Other Issues	52
5.7.1 Traffic and Transport	52
5.7.2 Aboriginal Archaeology	52
5.7.3 Water Resources	53
6. Conclusion/Recommendations	57
Selected References	60
Appendices	61
1 Minister's Terms of Reference	
2 List of Speakers at the Public Hearing	
3 Summary of Meetings	
4 Additional information from the Applicant	
5 Additional Information from the Department of Planning and Environment	
6 Additional information from the Environment Protection Authority	
7 Other correspondence	

Glossary

ACHCA	Aboriginal Cultural Heritage Conservation Area
AHD	Australian Height Datum
Applicant	Mount Thorley Operations Pty Limited. A reference to the Applicant includes the Applicant's EIS consultants
BMPA	Bulga Milbrodale Progress Association
CBA	cost benefit analysis
Commission	Planning Assessment Commission constituted for this Review and Public Hearing, Mr Paul Forward (Chair), Ms Lynelle Briggs AO and Mr Gordon Kirkby
CPP	coal preparation plant
DAE	Deloitte Access Economics
Department	NSW Department of Planning and Environment (previously Planning and Infrastructure)
DRE	Resources and Energy Division of NSW Department of Trade and Investment
DTI	NSW Department of Trade and Investment
EEC	endangered ecological community
EIS	<i>Mount Thorley Operations 2014 Environmental Impact Statement</i> prepared by EMGA Mitchell McLennan on behalf of the Applicant
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	Environment Protection Authority
EPBC Act	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
FBA	Framework for Biodiversity Assessment
HMA	habitat management area
HMP	Heritage Management Plan
INP	NSW Industrial Noise Policy
LEC	Land and Environment Court of NSW
LEC judgment	<i>BMPA v Minister for Planning and Infrastructure and Warkworth Mining Limited</i> [2013] NSWLEC 48 [391]
Mining SEPP	State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) Amendment (Resource Significance) 2013
Minister	Minister for Planning
Mt	million tonnes
Mtpa	million tonnes per annum

MTW	Mount Thorley Warkworth mining complex
NDA	non disturbance areas
NEPM	National Environment Protection Measure
OEH	NSW Office of Environment and Heritage
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter smaller than 10 micrometres
PM _{2.5}	particulate matter with an aerodynamic diameter smaller than 2.5 micrometres
Project	Mount Thorley Continuation Project
PSNL	project specific noise level
RBL	rating background levels
Review	The Commission's Review of the Mount Thorley Continuation Project, as detailed in this report
ROM	run-of-mine (coal that is delivered from the mine to the coal preparation plant that is not graded according to quality or size)
RFS	NSW Rural Fire Service
RTS	Applicant's Response to Submissions
Secretary	Secretary of NSW Department of Planning and Environment
Secretary's assessment report	Secretary's Environmental Assessment Report for the Mount Thorley Continuation Project (SSD-6465), referred to in the Terms of Reference as the preliminary assessment report
SEPP Amendment	State Environmental Planning Policy Amendment (Gas Exploration and Mining) 2014
SIA	social impact assessment
Terms of Reference	Minister's Terms of Reference for the Mount Thorley Review dated 6 November 2014
TSC Act	Threatened Species Conservation Act 1995
TSP	total suspended particulates
VPA	voluntary planning agreement

1.0 INTRODUCTION

1.1 DESCRIPTION OF MINES

Mount Thorley and Warkworth are open cut coal mines located approximately 10 kilometres southwest of Singleton and approximately three kilometres northeast of Bulga village in the Upper Hunter Valley (see Figure 1).

The Mount Thorley mine has been operating for more than 30 years, with mining operations commencing in 1981. The mine is currently operating under a consent issued by the then Minister for Infrastructure and Planning in 1996 under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (DA 34/95). This consent expires on 22 June 2017.

The mine is operated by Mt Thorley Operations Pty Ltd (the Applicant) and is comprised of a large open cut mining pit in the western end of the mining lease, overburden dumps behind the mining void, and a range of surface facilities in the eastern end of the mining lease including the Mt Thorley coal preparation plant (CPP). These surface facilities are located adjacent to the Mt Thorley Coal Loader which operates under a separate development consent.

Run-of-Mine (ROM) coal from the Mount Thorley mine is transported to the CPP for processing before being taken via conveyor to Mount Thorley Coal Loader for transportation to the Port of Newcastle¹.

Directly to the north of the Mount Thorley mine is the Warkworth Mine which is operated by Warkworth Mining Limited. Current mining operations at Warkworth are under a separate development consent issued by the then Minister for Planning in May 2003 (DA 300-9-2002I).

Despite operating under separate Ministerial consents, the two mines share a cross-linked ownership and management structure, with both mines managed by Coal and Allied Ltd (a subsidiary of Rio Tinto Ltd). Given this structure, the mines have operated as an integrated mine complex since 2004, known as the Mount Thorley-Warkworth mining complex (MTW). Under these arrangements, the mines share employees and surface infrastructure, and connect via a series of haul roads, conveyors and pipelines. The mines are also interdependent in an operational sense with coal, overburden, tailings and water being moved between them.

The approved operations of each of the mines is summarised in Table 1.

Table 1: Approved operations for Mount Thorley and Warkworth Mining Complex

Aspect	Warkworth	Mt Thorley
<i>Company</i>	Warkworth Mining Limited	Mt Thorley Operations Pty Limited
<i>Operations</i>	Commenced 1981	Commenced 1981
<i>Consent</i>	DA 300-9-2002-I (expires in 2021)	DA 34/95 (expires in 2017)
<i>Remaining Life</i>	6 years	2 years
<i>Mining Reserves as at November 2014</i>	128 Mt remaining	29 Mt remaining
<i>Mining Areas</i>	5 open cut pits (North, West, CD, Woodlands and South) with mining operations moving to the west towards Wallaby Scrub Road	3 open cut pits (Loders, Abbey Green North & Abbey Green South), with mining operations moving west towards Charlton Road

¹ EMGA Mitchell McLennan (EMM)(1), *Mount Thorley Operations 2014 Environmental Impact Statement*, Sydney, 2014, p.3

Aspect	Warkworth	Mt Thorley
<i>Extraction Rate</i>	Approved: up to 18 Mtpa ROM coal Actual in 2013: 13.3 Mt	Approved: up to 10 Mtpa ROM coal Actual in 2013: 5.4 Mt
<i>Coal Processing</i>	Coal is processed at the Warkworth CPP, which can process up to 13 Mt ROM coal a year, and the Mt Thorley CPP	Coal is processed at the Mt Thorley CPP, which can process up to 10Mt ROM coal a year, and the Warkworth CPP
<i>Coal Transport</i>	Coal is transported to the: • Mt Thorley Coal Loader by haul road and conveyor, and then railed to export markets • Redbank Power Station by conveyor (now closed)	Coal is transported to the Mt Thorley Coal Loader by haul road and conveyor, and then railed to export markets
<i>Overburden</i>	In-pit emplacement behind advancing mining operations at the Warkworth mine	In-pit emplacement behind advancing mining operations at the Mt Thorley mine
<i>Biodiversity Offsets</i>	Offset areas to the west and north of the approved mining operations covering 1,646 hectares with: • 757 ha in 2 non-disturbance areas; • 889 ha in 3 habitat management areas.	None
<i>Rehabilitation</i>	2,299 ha on site rehabilitation comprising a combination of woodland, open woodland and pasture. 870 ha rehabilitated across MTW complex at the end of December 2013.	Rehabilitate site to well treed grazing land. 870ha rehabilitated across MTW complex at the end of December 2013.
<i>Employment</i>	Approx. 1,300 with the Mt Thorley mine	Approx. 1,300 with the Warkworth mine

1.2 SURROUNDING AREA

The MTW mine complex is located in an area that is dominated by large-scale and intensive mining operations. Other mining operations in the area are detailed in the Secretary's assessment report² and include:

- Bulga open cut and underground mine complex, which is located to the south of the MTW complex and has consent to extract up to 26.2 million tonnes per annum (Mtpa) of ROM coal
- Wambo open cut and underground mine complex, which is located to the northeast of the MTW complex and has consent to extract up to 14.7 Mtpa of ROM coal
- Hunter Valley Operations mine complex, which is located to the north of the MTW complex and has consent to extract up to 36 Mtpa of ROM coal.

While much of the land in the vicinity of the MTW mine complex is owned by mining companies, large areas are used for a range of agricultural activities. The land along the Hunter River and Wollombi Brook is used for intensive agriculture and the rest of the agricultural land is used primarily for grazing³. One of the largest stands of remnant vegetation on the Hunter Valley floor is located immediately to the west of the complex. This vegetation forms part of a fledgling vegetation corridor between the Wollemi and Yengo National Parks to the southwest of the complex and the Barrington Tops National Park, which is located on the northern edge of the valley floor.

The nearest settlement to the MTW complex is Bulga village, which is located about three kilometres to the west of the mines. Bulga village lies at the base of an escarpment of Wollemi National Park to

² NSW Department of Planning and Environment, *State Significant Development Assessment Mount Thorley Continuation Project (SSD-6465)*, Secretary's Environmental Assessment Report, Sydney, 2014. This report is referred to in the Terms of Reference as the preliminary assessment report however for ease of reference this report is referred to as the Secretary's assessment report throughout this document.

³ Secretary's Environmental Assessment Report, p.4

the west, and the Wollombi Brook to the east. The village has a population of approximately 358 residents, with a population growth rate of 11.5% between 2006 and 2011⁴. The majority of residences are located off The Inlet Road, with residences at the western limit of The Inlet Road being slightly elevated and having direct views of the Bulga and Mt Thorley overburden dumps. Bulga village has a pub, service station and café, police station and rural fire brigade.

There are also several rural-residential properties located in close proximity to the complex, including Mt Thorley to the east; Hambledon Hill, Wylies Flat and Gouldsville to the northeast; Warkworth to the northwest; and Putty Road to the west.

⁴ Ibid, p. 8

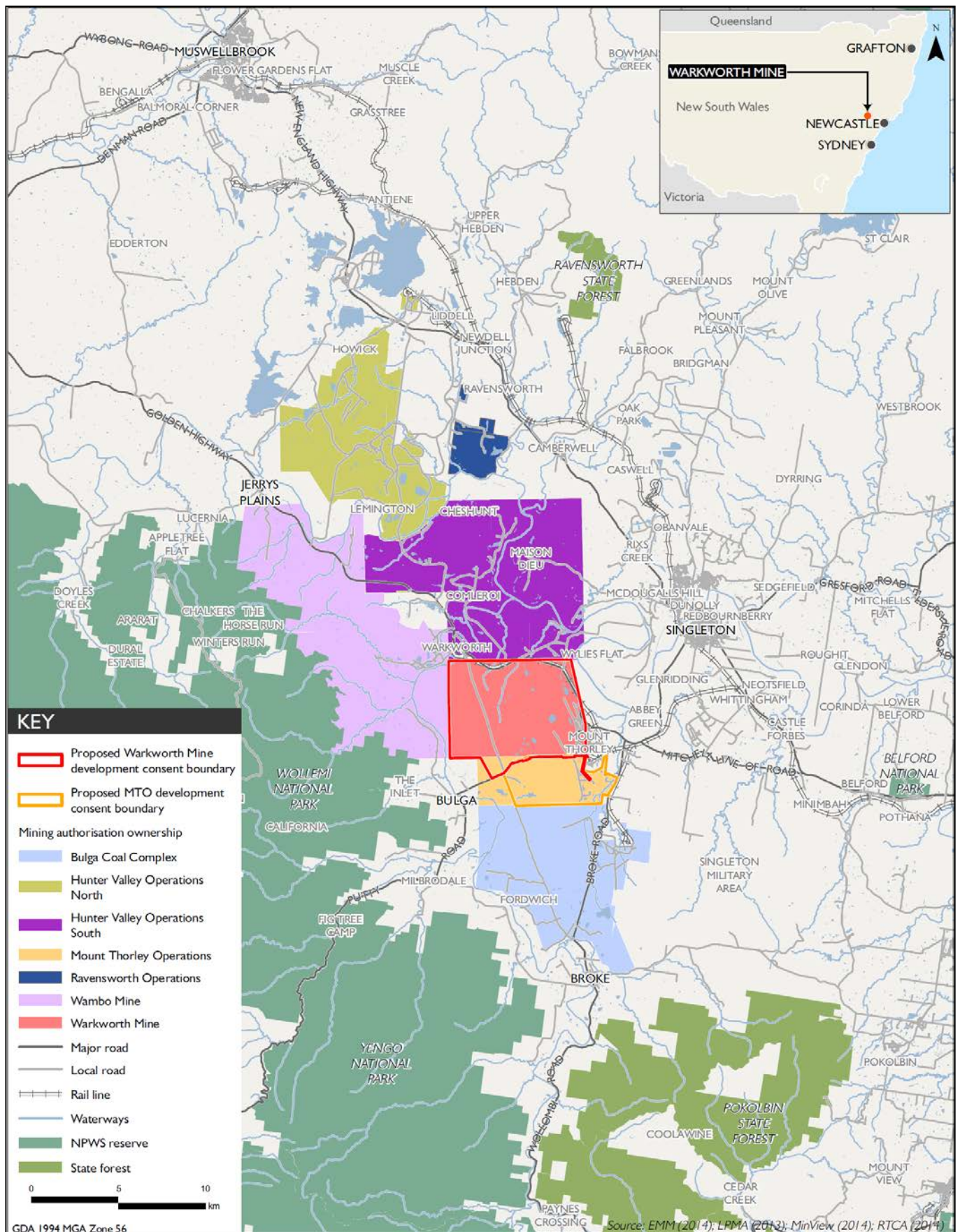


Figure 1: Site and surrounding area (source: Secretary's assessment report, 2014)

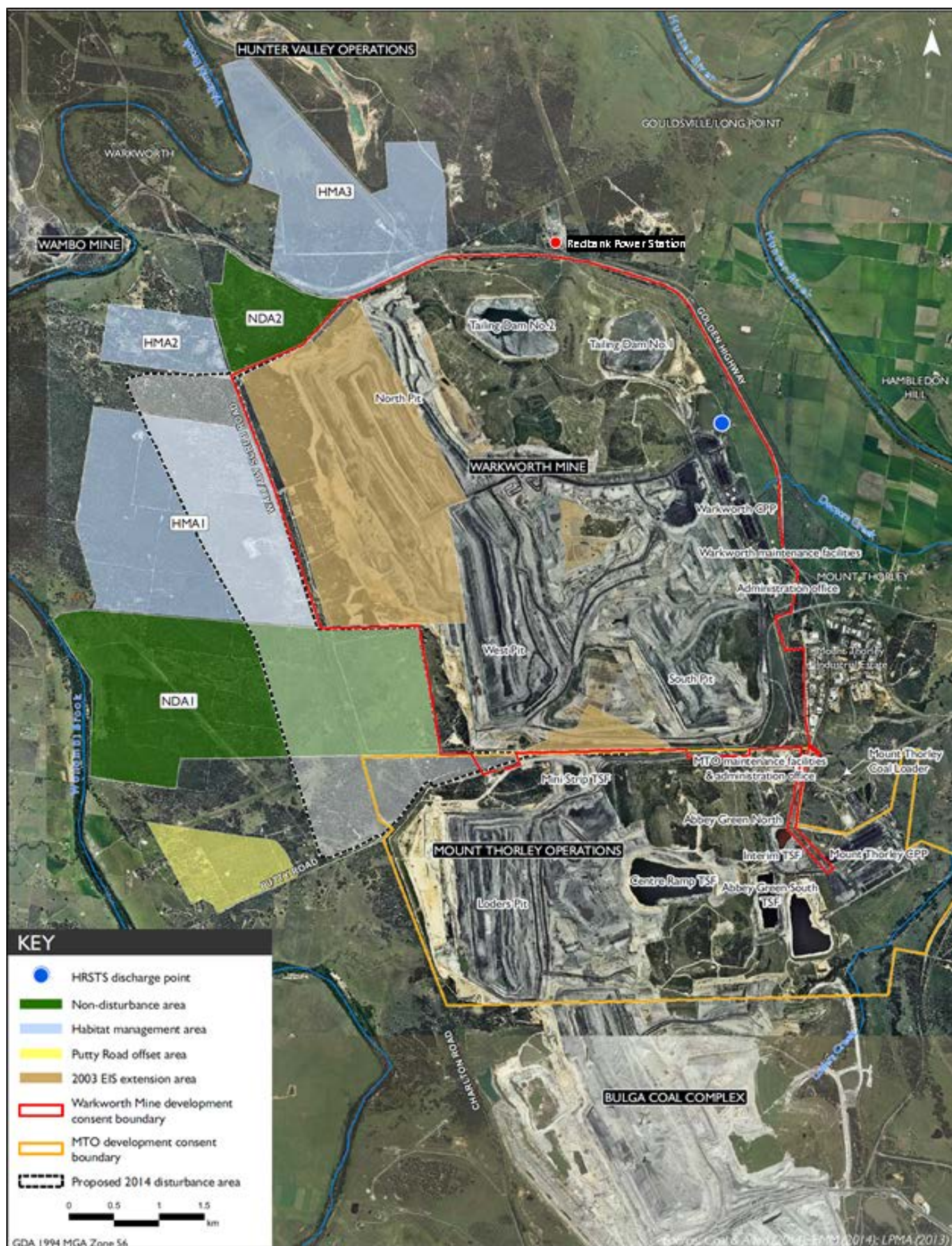


Figure 2: Existing operations (source: Secretary's assessment report, 2014)

2.0 BACKGROUND

2.1 1996 AND 2012 APPROVALS

The Mount Thorley mine currently operates under Development Consent No. DA 34/95 issued on 22 June 1996 by the then Minister for Urban Affairs and Planning under Part 4 of the EP&A Act. This consent is due to expire on 22 June 2017.

In 2010, the Applicant lodged a major project application for approval under the now repealed Part 3A of the EP&A Act (Application No. 09_0202). The proposal, a combined application for both Mount Thorley and Warkworth, involved the extension of the Warkworth mine complex to the west and south west to mine the underlying coal reserve until 2031. The application, known as the Warkworth Extension Project, was referred to the Planning Assessment Commission (the Commission) for determination in October 2011.

In February 2012, the Commission approved the Warkworth Extension Project, subject to stringent conditions. The approval comprised the following:

- Continued integration of the Warkworth and Mount Thorley mines
- Extension of the existing open cut operations by an additional 750 hectares, through Wallaby Scrub Road and Saddleback Ridge and through some of the green offset areas set aside under the 2003 consent as non disturbance areas (NDAs) and habitat management areas (HMAs)
- Extending the life of the mine by a further 11 years and extracting an additional 200 Mt of ROM coal
- Matching existing production levels, processing and coal transport arrangements
- Requiring biodiversity offsets to compensate for the impacts of the project on biological diversity, including on EECs.

In summary, the Commission's determination report provided the following rationale for approving the project:

- Subject to stringent conditions, the Commission considered that the benefits of the project outweighed the disadvantages
- The significant noise impacts warranted improved control over noise-generating activity at the mine complex and increased options for some residences likely to experience significant impact. These included:
 - imposition of at-source controls including purchase, retro-fitting and maintenance of noise attenuation equipment
 - improved practice during adverse meteorological conditions
 - improved monitoring and reporting
- Specific consideration should be given to properties that may experience significant impacts from the western expansion of Warkworth. The Applicant's proposal to provide an increased number of properties with acquisition options addressed the Commission's concerns
- The conditions of approval provided a sound basis for control of dust emissions, including:
 - improved monitoring and reporting requirements
 - improved provisions for incident notification
 - provision of information on health risks to potentially affected residents

- The closure of Wallaby Scrub Road without relocation was supported subject to conditions regarding emergency access, road and intersection upgrades, heritage management and compliant blasting operations. The Commission noted that the issue of compensation would need to be addressed by the relevant parties in the context of action necessary to effect closure of the road
- By 2012 standards, the 2003 biodiversity offsets were inadequate. This position was supported by the Office of Environment and Heritage (OEH)
- The proposal provided improved environmental outcomes and the approval conditions provided the level of certainty necessary to ensure that the new offset lands will be protected in the long-term
- The terms of the approval provided the best outcome available in the circumstances for the Bulga village. The environmental management requirements for the mine were made more onerous and explicit, enforcement options were expanded, and the option of acquisition was extended appropriately by the Applicant.

Following the Commission's decision, on 9 August 2012 the Commonwealth Minister for the Environment approved the mine's extension and relocation of the 2003 Commonwealth offsets under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

2.2 LAND AND ENVIRONMENT COURT APPEAL

The Bulga Milbrodale Progress Association (BMPA) is a community group opposed to the mine expansion and relocation of the 2003 Commonwealth offsets. Following the Commission's 2012 determination, the BMPA appealed to the NSW Land and Environment Court (LEC) against the merits of the approval⁵.

On 15 April 2013, the Court upheld the merit appeal and refused the Warkworth Extension Project. The Court's decision was based on the following:

- It had not been established that the project was justified on environmental, social and economic grounds
- The project would have significant and unacceptable impacts on biological diversity, including on EECs, noise and dust impacts, and social impacts
- The proposed conditions of approval were inadequate in terms of the performance criteria set and the mitigation strategies required to enable the project to achieve satisfactory levels of impact on the environment, including the residents and community of Bulga
- The proposed conditions of approval, including combining the Warkworth mine with the Mount Thorley mine, were likely to make monitoring and enforcing of compliance difficult, thereby raising the possibility that the project's impacts could be greater and more adverse than allowed by the conditions of approval.

The Applicant and the former Minister for Planning and Infrastructure subsequently appealed some of the legal technicalities associated with the LEC's judgment in the NSW Court of Appeal. This appeal was on matters of law, rather than on the merits of the project.

⁵ *BMPA v Minister for Planning and Infrastructure and Warkworth Mining Limited* [2013] NSWLEC 48 [391]

On 7 April 2014, the NSW Court of Appeal dismissed the appeal on all grounds, upholding the LEC's refusal of the project.

2.3 CHANGES TO LEGISLATION AND GOVERNMENT POLICY

Since the determination of the Warkworth Extension Project by the Commission, and the subsequent refusal by the LEC, there have been a number of changes to policy and legislation by the NSW Government in relation to mining assessments. The key changes are summarised below.

2.3.1 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) Amendment (Resource Significance) 2013 ("Mining SEPP")

On 4 November 2013, the NSW Government amended the Mining SEPP to clarify the factors to be considered in the decision-making process for proposals for mining of mineral resources. The amendment introduced a statutory requirement that the consent authority must consider the significance of the resource, in terms of:

- The economic benefits of developing the resource both to the State and the region in which the development is proposed to be carried out
- Any advice from the NSW Department of Trade and Investment (DTI) as to the relative significance of the resource in comparison with other mineral resources across the state.

Other factors, including environmental, social and economic impacts, must continue to be considered.

The 2013 amendments to the Mining SEPP also included:

- Details of key environmental, ecological and amenity criteria to protect water resources, habitat and amenity
- Provision for the OEH to certify biodiversity offsets and mitigation measures during the assessment process
- The introduction of non-discretionary development standards (for example cumulative noise levels, blasting, ground vibration and cumulative air quality levels) that cannot be used to refuse a mining application.

2.3.2 NSW Biodiversity Offsets Policy for Major Projects 2014 ("Biodiversity Offsets Policy")

In October 2014 the NSW Government introduced a new Biodiversity Offsets Policy. This Policy is supported by the OEH's Framework for Biodiversity Assessment (FBA) tool, which is used to calculate biodiversity impacts on a proposed development site and determine the offset requirements for those impacts⁶.

The purpose of the Biodiversity Offsets Policy is to provide a standardised, detailed and quantifiable methodology for assessing biodiversity offset requirements for major projects. The Secretary's assessment report explains that the new methodology provides a more strategic approach to the identification and management of biodiversity offset sites, which have traditionally been identified by individual proponents on a project by project basis.

⁶ OEH website: www.environment.nsw.gov.au

The Policy is based on the following six principles:

1. Before offsets are considered, impacts must first be avoided and unavoidable impacts minimised through mitigation measures. Only then should offsets be considered for the remaining impacts
2. Offset requirements should be based on a reliable and transparent assessment of losses and gains
3. Offsets must be targeted to the biodiversity values being lost or to higher conservation priorities
4. Offsets must be additional to other legal requirements
5. Offsets must be enduring, enforceable and auditable
6. Supplementary measures can be used in lieu of offsets.

The Policy enables biodiversity liability to be addressed through direct offsets, by translating liability into a monetary value to provide funding into an offset account, or through supplementary non-land based offsets (for example, contributing to an environmental recovery program). Mine rehabilitation may also be considered an acceptable (albeit discounted) offset. All offsets are to be provided under a bio-banking agreement, rather than through a Voluntary Planning Agreement (VPA) and/or approval conditions.

At a meeting in December 2014 between the Commission and officers from the Department of Planning and Environment (the Department), OEH, Environment Protection Authority (EPA) and NSW Office of Water (NOW) the agencies explained that the Biodiversity Offsets Policy recognises that it may not be possible to offset all impacts associated with a development, but for economic and/or social reasons the development may still be approvable (refer minutes at Appendix 3).

2.3.3 Voluntary Land Acquisition and Mitigation Policy

In December 2014 the NSW government released State Environmental Planning Policy Amendment (Gas Exploration and Mining) 2014 ("SEPP Amendment"). This amendment introduces the Voluntary Land Acquisition and Mitigation Policy, which seeks to protect landholders from noise and dust impacts associated with mining, petroleum and extractive industries. This policy must now be considered by consent authorities when determining all existing and future State Significant development applications.

The Voluntary Land Acquisition and Mitigation Policy sets out the criteria for noise and particulate matter where voluntary mitigation and acquisition rights apply, but only encourages acquisition as a last resort after all reasonable and feasible mitigation measures have been undertaken. The preferred approach is to manage exceedances of the relevant assessment criteria through negotiated agreements between the mine and the affected landowners.

In circumstances where acquisition is the only option, the policy provides that the acquisition price to be paid by a proponent should not be less favourable than a 'market value' rate. This rate is calculated as if the land was unaffected by the development and with reference to section 55 of the *Land Acquisition (Just Terms Compensation) Act 1991*⁷.

⁷ NSW Government Voluntary Land Acquisition and Mitigation Policy (December 2014)

3.0 CURRENT APPLICATIONS

The current applications propose a modified version of the 2010 Warkworth Extension Project that was approved by the Commission in 2012 and subsequently refused by the LEC in 2013.

The 2010 proposal sought to facilitate and formalise integration between the Warkworth and Mount Thorley mines, with the Warkworth mine relying on Mount Thorley's infrastructure and facilities following completion of mining at Mount Thorley in 2017. Given that the LEC was critical of the integrated approach to mine complex management, separate development applications have now been lodged for each mine with the intention of maintaining separate development consents for each.

Sections of the community have expressed frustration that these further applications have been lodged for a similar scope of works. It is noted that under the EP&A Act, the Applicant is entitled to lodge a new application for the modified project, despite the LEC's findings on the original Warkworth Extension Project. The Commission must review any proposal referred to it by the Minister on merit.

3.1 MOUNT THORLEY CONTINUATION PROJECT

The Mount Thorley Continuation Project involves the continuation of the existing open cut mining operations from Loders Pit and Abby Green North Pit (see Figure 2) at a rate of up to 10 Mtpa of ROM coal. Extraction of this resource is expected to continue until 2022, however a 21 year consent period is sought to enable the ongoing provision of services to Warkworth mine. These services are considered critical to the viability of the Warkworth mine and rehabilitation of both mines, and include equipment, personnel, overburden transfer, water, coal rejects and coal preparation.

In addition, the Applicant is seeking the following changes to the existing Mount Thorley consent:

- Upgrade of the Mount Thorley Coal Preparation Plant to facilitate an increased maximum throughput of 18 Mtpa of ROM coal
- Transfer of overburden between Mt Thorley and Warkworth mines to assist in the rehabilitation and final landform design of the MTW complex
- Upgrade of the MTW integrated water and tailings management systems.

A summary of the Mount Thorley Continuation Project is provided in Table 2.

Table 2: Summary of the Mount Thorley Continuation Project

Aspect	Description
<i>Project Summary</i>	• Continuation of existing and approved development on site; • Maintaining maximum coal extraction rates at 10 Mt of ROM a year; • Receiving coal, tailings and overburden from the Warkworth mine; • Receiving overburden from the Bulga mine; • Water sharing with other mines; • Minor infrastructure upgrades; and • Progressively rehabilitating the site.
<i>Project Life</i>	21 years
<i>Mining & Reserves</i>	No change. Extraction of remaining coal resource (about 29 Mt of ROM coal).
<i>Mining Areas</i>	No change. Loders Pit and Abby Green North Pit.
<i>Consent Boundary</i>	Minor amendment to exclude a 63 ha area that would be included in the proposed Warkworth

Aspect	Description
	extension area.
<i>Extraction Rate</i>	No change. Maximum extraction rate would remain 10 Mt of ROM coal a year.
<i>Coal Processing</i>	Increased throughput at the Mt Thorley CPP from 10 Mt to 18 Mt a year of ROM coal.
<i>Coal Transport</i>	No change. Product coal would continue to be transported to the Mt Thorley Coal Loader by haul road and conveyer, and transported by rail to export markets.
<i>Overburden Emplacement</i>	Overburden would continue to be emplaced in-pit behind the advancing mining operations. In addition, overburden from Warkworth mine is proposed to be transferred to Mt Thorley mine for use in development of the final landform.
<i>Rejects Disposal</i>	Coarse rejects and tailings would continue to be disposed of in-pit and at tailings storage facilities at either Warkworth or Mt Thorley mines. The integrated MTW tailings management system would be upgraded, including: • use of the northern part of Loders Pit as a tailings storage facility after completion of mining; and • wall lift to centre ramp tailings storage facility to increase its capacity.
<i>Infrastructure</i>	• Upgrade the Mt Thorley CPP to facilitate an increased maximum throughput of 18 Mt of ROM coal. • Potential upgrade and augmentation of existing surface infrastructure and mobile and in-pit facilities.
<i>Water Management</i>	Upgrade the integrated MTW water management system, including: • upgrade the approved discharge point, and increase the rate of discharge into Loders Creeks from 100ML a day to 300ML a day via the Hunter River Salinity Trading Scheme; • transfer and accept mine water from neighbouring mines including Warkworth, Bulga Coal Complex, Wambo mine and Hunter Valley Operations; and • increase the storage capacity of the southern out-of-pit dam from 1.6 GL to 2.2 GL.
<i>Rehabilitation</i>	Backfill Loders Pit and establish at least 483 ha of EEC woodland on the rehabilitated Mt Thorley mine (2,100 ha including the rehabilitated Warkworth mine) .
<i>Employment</i>	Approximately 120 long term full time positions (1,300 including Warkworth mine)
<i>Capital Value</i>	Approximately \$4 million (\$719 million including Warkworth mine)
<i>Royalties</i>	Approximately \$50 million (\$617 million including Warkworth mine)

3.2 WARKWORTH CONTINUATION PROJECT

The Warkworth Continuation Project is considered in a separate Review by the Commission.

3.3 THE SECRETARY'S ASSESSMENT REPORT

The Secretary's assessment report has been submitted to the Commission for consideration as part of the Review process. The reports consider the proposal, its strategic and statutory context, public and agency submissions, and the Applicant's EIS and Response to Submissions report. They identify the key issues relating to this application to be noise, air quality and visual impacts.

The report concludes:

- The continued extraction of a coal resource from the approved mining operations using existing infrastructure on site would result in a range of economic benefits to the Singleton LGA, the Hunter region and to the State of NSW

- The combined benefits of the two mines include a net economic benefit of approximately \$1,488 million, \$617 million in royalties for the NSW Government, and continued employment for the 1,300 people that currently work at the MTW complex⁸
- Residual noise, air quality and visual impacts are predicted, however a detailed set of conditions are recommended to ensure that the impacts are effectively minimised, mitigated and/or compensated for.

Overall, the Department is satisfied that the Applicant has designed the project in a manner that achieves a reasonable balance between maximising the recovery of the coal resource and minimising the potential impacts on surrounding land users and the environment.

⁸ Secretary's Environmental Assessment Report – Mt Thorley Continuation Project, 2014 (p.31) and Secretary's Environmental Assessment Report – Warkworth Continuation Project, 2014 (p.85).

4.0 THE COMMISSION'S PROCESS

4.1 TERMS OF REFERENCE FOR THE REVIEW

Under Section 23D of the EP&A Act the Minister has requested the Commission conduct a review of the Project and hold a Public Hearing. The Minister's Terms of Reference for the Mount Thorley Continuation Project Review are dated 6 November 2014 and are as follows:

1. *Carry out a review of the Mount Thorley Project, and:*
 - (a) *Consider the EIS for the project, the issues raised in submissions, the formal response to submissions, the Department of Planning and Environment's preliminary assessment report of the project, and any other relevant information provided on the project during the course of the review;*
 - (b) *Assess the merits of the project as a whole, paying particular attention to the potential amenity, health and social impacts on the village of Bulga and surrounds;*
 - (c) *Apply all relevant NSW Government policies in those considerations and to that assessment; and*
 - (d) *Provide recommendations on any reasonable and feasible measures that could be implemented to avoid, reduce and/or offset the potential impacts of the project.*

The Commission was asked to conduct a Public Hearing during the Review by no later than 12 December 2014. However, this direction and the Secretary's assessment report were only received on 14 November 2014. In order to give reasonable notice to the community, the Public Hearing was held on 18 and 19 December 2014.

4.2 PUBLIC HEARING AND SUBMISSIONS

The Public Hearing was held on 18 and 19 December 2014 at the Singleton Heights Diggers Club. Approximately 50 verbal submissions were made to the Commission at the hearings including from representatives of special interest groups, Singleton Council and individual residents. All those who registered to speak and attended the hearing were heard. The Commission also received written and photographic submissions. Copies of the submissions are available on the Commission's website: <http://www.pac.nsw.gov.au>.

A summary of the issues raised at the Public Hearing is provided in Table 3.

Table 3 – Summary of main issues raised at the Public Hearing and in submissions

Issue	Submissions from Public Hearing
Summary of submissions supporting the project	
Social and Economic	• The mines will provide direct and indirect regional employment within the Upper Hunter and wider region • The project will stimulate economic growth for the region • Social implications associated with employment, including mental health and vitality of local towns • Continuation of an existing mine complex within defined lease area • Impact on property prices if mining does not continue in the area
Summary of submission objecting to the projects	
Procedural issues and historical agreements	• Proposals are the same projects that were refused by the LEC • Change of assessment criteria and government policy in favour of Applicant • Faith put into 2003 Deed of Agreement which conserved and protected land in the NDAs and HMAs • Investment decisions were made by local residents based on the 2003 Deed • Amendments and disregard of 2003 Deed of Agreement • Concern regarding the review process and the community losing third party appeal rights • Lack of faith in the Commission and the Department/state government
Water	• Surface and groundwater impacts • Proposal will make contamination worse • Dredging impacts on aquatic and estuarine habitats • Cumulative impacts on the Hunter River
Biodiversity	• Concerns about loss and potential extinction of Warkworth Sands Woodlands • Insufficient offset strategy, particularly offsetting removal of portions of Warkworth Sands Woodlands • Impact on native fauna, including wallabies, bats and birds • Loss of flora, including EECs
Land and Environment Court	• Issues identified in LEC judgment have not been adequately addressed
Air Quality	• Potential impact on air quality in Bulga village and the wider region • Health and amenity implications for the local population • Impacts of fine particles on human health • Air quality will be exacerbated • Quantity and accuracy of monitoring stations and procedures
Saddleback Ridge and visual impacts	• Visual impact of the expansion of the mining complex, particularly from Bulga village • The importance of the Saddleback Ridge in terms of noise attenuation • Minimising air quality impacts and visual protection from the mines • The ridge should remain the outer limit of the mining complex • The mine should go underground from Saddleback Ridge

Issue	Submissions from Public Hearing
Wallaby Scrub Road	• The road was perceived/understood by the community to be the outer limit of the mining complex • Impact of road closure and consequential mine expansion on Bulga village • Loss of community asset, with no offer to date of compensation to the Council • Concern about future access for emergency vehicles • Road should be relocated rather than closed completely
Social	• Social impacts on the community • Resale values of properties and inability to sell properties at a fair price • Impacts on the social fabric and infrastructure of Bulga village • Visual impacts particularly for residents west of the proposed mine • Impacts on health from noise, vibration and dust
Aboriginal heritage	• Impact on existing Aboriginal heritage, artefacts and culture • Removal of artefacts and relocation to Sydney, rather than keeping them in the area
Noise	• Loss of Saddleback Ridge will remove a buffer between Bulga village and the mining complex, resulting in increased noise and visual impacts • Increased noise and vibrations generally • Disregard of LEC Court judgement, including methodology requirements in the NSW Industrial Noise Policy (INP) • Quantity and accuracy of monitoring stations and procedures • Assessment of background noise levels
Cumulative impacts	• Cumulative long-term impact of all mining projects in the Hunter Valley on the environment, health and communities, particularly rural communities and their long term survival
Compliance issues	• Non-compliance with existing conditions of consent, including those relating to noise and air quality

4.3 DOCUMENTS, MEETINGS AND SITE INSPECTIONS

4.3.1 Documents

The Commission has reviewed a wide range of documents including:

- The Applicant's EIS for the Mount Thorley Continuation Project and Warkworth Continuation Project (prepared by EMGA Mitchell McLennan, both dated June 2014)
- The Applicant's Response to Submissions (RTS) for the Mount Thorley Continuation Project and Warkworth Continuation Project (prepared by EMGA Mitchell McLennan, both dated November 2014)
- Submissions from government agencies, special interest groups and the public made to the Department on the EIS
- Submissions made directly to the Commission
- The Secretary's assessment reports for both the Mount Thorley Continuation Project and Warkworth Continuation Project (both dated November 2014).

4.3.2 Meetings and site inspections

The Commission attended the following meetings in relation to this review, in conjunction with the review of the Warkworth Continuation Project application:

- On 5 December 2014 the Commission was briefed on the projects by representatives of:
 - the Department
 - the OEH
 - the Department of Trade and Investment (Resources and Energy Division)
 - the EPA
 - the NOW.
- On 9 December 2014 the Commission inspected the MTW mining complex and met with the Applicant to discuss the current applications
- On 9 December 2014 the Commission visited the area surrounding the mine, including Bulga village
- On 9 December 2014 the Commission met with representatives of Singleton Council to hear its view of the projects
- On 5 February 2015 the Commission met with representatives of the Department to discuss a range of issues raised at the Public Hearing and in public submissions.

A summary of the matters discussed at the Commission's meetings is provided in Appendix 3.

4.4 PROCESS FROM HERE

In this Review report the Commission provides its findings and recommendations to the Department, as requested by the Minister. The Department will then prepare its final assessment report having regard to the Commission's findings. The final assessment report will then be forwarded to the Commission to make a determination on the application.

5.0 CONSIDERATION OF KEY ISSUES

The following is a consideration of the key issues in relation to the Mount Thorley Continuation Project. Consideration of the key issues in relation to the Warkworth Continuation Project is provided in a separate Commission Review Report.

5.1 ECONOMIC IMPACTS AND BENEFITS

While the Mount Thorley operations are a minor part of the proposed expansion to the mining complex, they are integral to its operation in terms of infrastructure and rehabilitation. Therefore, the economic assessment below considers both Warkworth and Mount Thorley mines.

5.1.1 Significance of the resource

Under Clause 12AA of the Mining SEPP, a consent authority must consider the significance of the resource that is the subject of a mining application. The consent authority must have regard to:

- the economic benefits, both to the State and the region in which the development is proposed to be carried out, of developing the resource
- any advice from the DTI as to the relative significance of the resource in comparison with other mineral resources across the State.

NSW has a large and mature coal industry based around substantial coal resources. Over the past decade, NSW coal production has grown steadily due to growing demand from export markets in Asia. Despite a recent downturn, world energy demand is expected to increase over at least the next 20 to 30 years, and thermal coal is likely to remain a key energy source over this period⁹. According to the Secretary's assessment report for the Warkworth Continuation Project, NSW produces around 120 Mtpa of export coal, with almost 60 per cent of this produced in the Hunter Valley.

The proposed continuation projects generate substantial economic activity which confers significant economic benefits to NSW and the Hunter region. These are outlined in detail in the Applicant's EIS.

The economic activity generated by continuation of the Mount Thorley mine and the economic benefits this produces include:

- Extraction of the remaining coal resource (about 29 Mt of ROM coal);
- Net capital expenditure with an NPV of \$4 million;
- Continuation of approximately 120 jobs for an additional 14 years; and
- The payment of \$50 million in royalties in NPV terms to the State.

The Commission also notes that the combined proposals will result in indirect economic benefits. Approximately 35 per cent of the mine complex's employees and long-term contractors live in the Singleton local government area; and it is estimated that the local flow-on effect from the mines' expansion would be \$84 million in additional income and the continued employment of 61 full-time equivalent workers.¹⁰

⁹ Secretary's assessment report (Warkworth), p.17

¹⁰ BAEconomics, *Economic Impact Assessment for Warkworth Continuation 2014 and Mount Thorley Operations 2014*, Canberra, 2014, p.3

The second consideration when determining the significance of the resource under the Mining SEPP is any advice received from the DTI. In August 2014, the DTI provided written advice to the Department in support of the project due to the economic significance of the resource. The significant integration between the Warkworth and Mount Thorley projects was acknowledged by the DTI, as together the mining complex is the third largest in NSW, with continuous operation for over 30 years.

The Department accepts that while the Mount Thorley resource in isolation is not significant in either absolute or relative terms, it has a market value of between \$2.5 and \$3 billion and will contribute to the net economic benefit created by the MTW.¹¹

Having considered the economic benefits outlined above, the Commission accepts that the resource of the mining complex as a whole can be considered significant as its extraction would deliver substantial benefits to the region and state of NSW. The Commission recognises that if the Warkworth and Mount Thorley projects were not approved, there would be substantial adverse economic impacts (especially to the towns of Singleton and Cessnock). These include the loss of significant royalties to the NSW government, a reduction in infrastructure projects to the Hunter region and lower wage and salary income for both current employees and contractors.

5.1.2 Economic study and cost benefit analysis

The LEC appeal against the 2010 Warkworth Extension Project found that the Applicant's economic analyses were of limited value, and did not support the assertion that the benefits of the project outweighed the environmental, social and other costs. For example, the input-output analysis was found to have deficiencies in terms of data and assumptions, which in turn affected the reliability of conclusions regarding the net economic benefits associated with an approval. Other economic tools used by the applicant were also considered to be deficient.

In response to the Court's judgment, the Applicant submitted an Economic Study as part of the EIS for both continuation projects. The study includes a Cost Benefit Analysis (CBA) prepared by BAEconomics in accordance with applicable NSW Government guidelines. The CBA considers the environmental and social impacts of the proposal, the principles of ecologically sustainable development, and the cost associated with rehabilitating the site. It also includes a sensitivity analysis to account for potential changes to fundamental inputs that may occur over time, such as the export price of coal.

The CBA calculates that the MTW complex would deliver direct net economic benefits to NSW of approximately \$1.5 billion (NPV)¹². Even under a scenario where the coal price decreases by \$10 a tonne and the Australian dollar appreciates to an average of 95 US cents, the CBA indicates that the project would remain above \$1.2 billion in net benefits.¹³

In the Secretary's assessment report for the Warkworth Continuation Project, it is noted that CBAs are not a 'precise science' because they value environmental and social externalities in monetary terms, and these valuations may vary from one expert to another. To test the methodology and assumptions in the applicant's CBA against applicable NSW Government guidelines, the Department commissioned Deloitte Access Economics (DAE) to conduct a peer review of the BAEconomics CBA.

¹¹ Secretary's assessment report (Mount Thorley), P.15

¹² BAEconomics, op.cit., p.1

¹³ Secretary's assessment report (Warkworth), p.18

In summary, DAE concludes the following:

- The CBA provides a broadly robust coverage of the economic costs and benefits of the project to the region and NSW, and meets the majority of the requirements set out in:
 - The Guideline for the use of Cost Benefit Analysis in mining and coal seam gas proposals (NSW Government 2012)
 - The Guideline for economic effects and evaluation in EIA (PlanningNSW 2002)
 - NSW Government guidelines for economic appraisal (NSW Treasury 2007)
- A number of aspects of the assessment should be improved to provide a more detailed assessment of the project-level cost and benefits. An alternative structure was recommended by DAE, which is shown on page 18 of the Secretary's assessment report
- The alternative structure would assist with aligning the CBA with best practice, ensuring consistency with applicable guidelines; and allowing the disaggregation of the project-specific impacts from broader State and regional benefits.

In response to the concerns raised by DAE, on 21 November 2014 the Department requested additional project level cost and benefit information. This data was required to provide a greater breakdown of the underlying assumptions contained in the economic assessment.

On 10 December 2014 the Applicant provided a response to the Department, which states that the information requested by DAE is based on a non-mandatory table in a guideline. The Applicant's view is that the Secretary's requirements have been fully met and that the economic assessment is robust and generally accords with relevant guidelines and industry practice. Notwithstanding this, Rio Tinto sought to address the concerns raised by DAE by providing additional economic data where possible; and additional evidence that the underlying project information and assumptions are reasonable. This additional information is included at Appendix 4.

The Commission notes that the BMPA has questioned the Applicant's economic analysis, in particular the input data which it believes unreasonably favours the Applicant. In its submission, the BMPA refers to an assessment of the analysis carried out by The Australia Institute, which claims that the mining complex is not viable and that the economic benefits flowing to the community have been inflated and do not compensate for its social and environmental impacts. It also claims that the DAE review is highly critical and the Applicant's economic evaluation of the proposals is inadequate.

The Commission has reviewed all relevant documentation relating to the methodology used to determine the economic costs and benefits of the projects and reached the following conclusions:

- The Commission's assessment of the CBA is based on the assumption that the estimates provided by the Applicant are true. In particular, the substantial estimated benefits of the project from higher compensation of employees and contractors are driven by the differential between average wages and salaries in the Mid and Upper Hunter region and those earned at the mine. The Applicant has not provided the average wage and salary assumed to be paid at the mine, meaning the estimates cannot be verified by the Commission. Similarly, the Commission accepts the validity of the BAEconomics spreadsheet modelling
- The Commission notes that while the updated economic assessment is more informative than the documentation submitted as part of the 2010 proposal, there is still community concern that it does not fully account for the impact on the community and the loss of environmental assets. Moreover, some of the key inputs into the CBA have changed in recent times, including the value of the Australian dollar and coal prices.

- The Commission recommends that the Applicant's economic assessment, including the CBA, be updated to reflect the current economic climate
- The Commission notes that the DAE peer review concludes that the CBA is broadly sound and provides a good overview of the regional impacts of the proposal, both at the NSW and local level
- DAE has not been provided with an opportunity to review the additional information provided by the Applicant in response to its peer review. As part of the determination of the projects, DAE should be asked to review the information and any updated economic assessment/CBA provided by Rio Tinto and provide updated advice to the consent authority
- The Commission agrees with the Department's view that the matters raised by DAE do not substantially change the broad conclusion that the expansion of the MTW mining complex would result in a significant positive net economic benefit for the Hunter region and NSW
- In terms of the financial viability of the mine, the Commission agrees with the Applicant's position that this is a risk assumed by the owners of the mine¹⁴.

Recommendation

1. The Applicant's economic assessment, including the CBA, should be updated to reflect the current economic climate.
2. As part of the determination of the project, DAE should review the additional information and any updated economic assessment/CBA provided by the Applicant and provide updated advice to the Department as required.

5.1.3 Economic impacts to Bulga village

Notwithstanding the economic benefits associated with the proposal, the Commission is aware that the two continuation projects could result in economic impacts to the residents of Bulga village. The key concern of the BMPPA and Bulga residents is that property values will be detrimentally affected by the expansion plans for the mine, and that there is no requirement for Rio Tinto to compensate for the reduced value of their property.

The presentations made at the Public Hearing raised a consistent theme from Bulga's residents - that the 2003 approval and associated Deed of Agreement have been relied upon by individuals investing in Bulga village. As outlined under Section 2.1 of this Review, the 2003 approval and Deed included the retention of Saddleback Ridge and Wallaby Scrub Road. This aspect of the approval provided a physical and visual buffer between the MTW mining complex and Bulga village. As a consequence, a number of Bulga's residents are understood to have purchased properties, made improvements to existing properties and/or encouraged family members to relocate to Bulga village. This experience is depicted in affidavits made to the LEC as part of the 2012 appeal, which were resubmitted to the Commission as part of the current Review. One example is the experience of John Krey:

"...I read the 2003 project approval for the Warkworth Mine extension...I remember noting a reference, in the conditions, to a deed of agreement, to be entered into by the mine and the Minister, to permanently protect non-disturbance areas, where open cut mining was to be excluded. This gave me considerable comfort that the land west of Wallaby Scrub Road would be protected. In or about 2003, construction commenced on our new house on our property. We had initially intended on only building a small simple style house open planned. However, with the reassurance that Warkworth Mine and other nearby mines would not be

¹⁴ EMGA Mitchell McLennan (EMM)(2), *Warkworth Continuation 2014 Response to Submissions*, Sydney, 2014, p.266

coming any further west towards Bulga than Wallaby Scrub Road, we decided to invest a lot more capital and build a larger pavilion style house with courtyards”.

In response to the issues raised by BMPA and residents of Bulga village, the Applicant has noted that notwithstanding the 2003 approval, the proposed extent of mining is well within the lateral limits of MTW's mining leases on land privately-owned by WML and Miller Pohang Coal Company Pty Limited. In addition, Rio Tinto points out that the original Deed was an early attempt at offsetting by the Department and one that does not achieve the biodiversity goals of current government policy¹⁵.

The Applicant has stated that there is no evidence of substantial decline in property prices due to the previous application for the Warkworth Extension 2010 or the current proposal¹⁶. This position is based on a property devaluation study undertaken by Judith Stubbs in 2012. The BMPA has criticised various aspect of the Stubbs report¹⁷.

The Commission does not accept the Applicant's position that the expansion of the MTW mining complex will not result in property devaluation in Bulga village. The Commission accepts that property values could be negatively affected and that the encroachment of mining will make it more difficult for land owners to sell their property. The Commission understands the difficult position faced by the residents of Bulga village, particularly given the apparent degree of certainty provided by the 2003 consent. However, the economic benefits associated with the mine by way of employment and royalties (as outlined earlier in this section) warrant consideration and there may be a need to look at alternative options for the residents of Bulga village.

The Commission is aware of the government's recent policy on land acquisition, but also understands community concerns regarding encroachment of the mine around Bulga village. In this regard, the Commission has taken account of the Hicks Kaldor compensation principle. When applied, this principle results in a Pareto superior solution, whereby those who are better off as a result of an investment are able to compensate the losers and still be better off.

The Commission has carefully considered possible options for the future of Bulga village, including:

- Compensating property owners who wish to sell
- Relocating the village at the expense of the NSW government and Applicant
- Developing a village enhancement strategy, similar to the approach taken with the Ashton open cut mine and Camberwell village

One option would require the Applicant to compensate property owners in Bulga who wish to sell. The compensation amount would be the difference between movements in the average regional/sub-regional property price and that of local property sale prices based on an independent valuation process. A dispute resolution process would also need to be agreed in respect of this option.

Relocating Bulga village would require the government to fund the delivery of new infrastructure and the Applicant to fund the construction of new houses. It is important to note that the Commission has not consulted with the community, Council or applicant regarding this proposition. However, the Commission believes that this is an option worthy of genuine consideration when the

¹⁵ EMGA Mitchell McLennan (EMM)(2), op.cit., p.286

¹⁶ Ibid, p.326

¹⁷ BMPA submissions to the NSW Department of Planning and Environment (2014), p.70

applications return to the Department for determination. Such relocations are undertaken already in dam approvals. Any relocation decision and associated planning would, of course, need to involve the residents of Bulga. It is recognised that this option is not an approach that would generally be considered, however the Commission believes that in this instance there are a unique and unusual set of circumstances that make it worthy of serious consideration.

A further option is to take a similar approach to that taken with the Ashton open cut mine and Camberwell village, whereby the Department recommended conditions requiring the applicant to develop a Camberwell Village Enhancement Strategy in consultation with the local community and Council. The applicant was also required to fund and implement a program of works via a VPA with the Minister and Council, or fund a program of works of other identified community infrastructure within the Singleton local government area.

Recommendations

3. The following options should be considered for the future of Bulga village:
 - a. Compensating property owners who wish to sell. This compensation would be paid by the Applicant and the compensation amount would be the difference between movements in the average regional/sub-regional property price and that of local property sale prices based on an independent valuation process. A dispute resolution process would also need to be agreed
 - b. Relocating the village at the expense of the NSW government and Applicant. The government would be required to deliver all new infrastructure, while the applicant would be required to pay for the construction of new houses. Any relocation decision and associated planning would need to involve the residents of Bulga
 - c. Requiring the Applicant to develop a Village Enhancement Strategy in consultation with the local community and Council and to fund and implement a program of works or similar via a VPA with the Minister and Council.

The other impacts of the mine on Bulga village are discussed in other sections of this report.

5.1.4 Summary

The Commission accepts that the resource of the mining complex as a whole is economically significant as its extraction will deliver substantial benefits to the region and state of NSW. The Commission recognises that if the Warkworth and Mount Thorley projects were not approved, there would be substantial adverse economic impacts, including the loss of significant royalties to the NSW government, a reduction in infrastructure projects to the Hunter region and lower wage and salary income for both current employees and contractors.

The Commission notes that a CBA has been prepared for the project and that this has been peer reviewed by DAE at the request of the Department. While DAE found that the CBA is broadly sound and provides a good overview for the regional impacts of the proposal, it did find that a number of aspects of the analysis needed further consideration. The Applicant has responded to these concerns and the Commission considers that DAE should be given the opportunity to review the Applicant's responses.

The Commission has carefully considered the issue of the impact that the project will have on Bulga village property values and accepts the argument put forward by BMPA and others that the mine's encroachment will have a negative impact on property prices and on the ability of residents to be

able to sell their properties in the future. The Commission is of the view that serious consideration should be given to options to ameliorate this impact, including compensating property owners, potentially relocating the village, developing an enhancement strategy for the village and/or undertaking a program of works. The unique and unusual set of circumstances that apply in this case warrants consideration of these options.

Recommendations

1. The Applicant's economic assessment, including the CBA, should be updated to reflect the current economic climate.
2. As part of the determination of the project, DAE should review the additional information provided by the applicant and any updated economic assessment/CBA provided by the applicant and provide updated advice to the Department as required.
3. The following options should be considered for the future of Bulga village:
 - a. Compensating property owners who wish to sell. This compensation would be paid by the Applicant and the compensation amount would be the difference between movements in the average regional/sub-regional property price and that of local property sale prices based on an independent valuation process. A dispute resolution process would also need to be agreed
 - b. Relocating the village at the expense of the state government and applicant. The government would be required to deliver all new infrastructure, while the applicant would be required to pay for the construction of new houses. Any relocation decision and associated planning would need to involve the residents of Bulga
 - c. Requiring the Applicant to develop a Village Enhancement Strategy in consultation with the local community and Council and to fund and implement a program of works or similar via a VPA with the Minister and Council.

5.2 SOCIAL IMPACTS

5.2.1 Social benefits and impacts of the proposal

The EISs for both the Warkworth and Mount Thorley Continuation projects included a Social Impact Assessment (SIA) that considers the positive and negative impacts of the mines on the region. These impacts are also addressed in Appendix C of the Applicant's RTS report.

The SIA was prepared by EMGA Mitchell McLennan (EMM) in accordance with the Secretary's requirements, and seeks to address the issues identified in the LEC judgment with regard to the social implications associated with the projects. The view of the LEC regarding the 2010 proposal was that the adverse change in the composition of the community due to the acquisition of properties was likely to cause adverse social impacts on some individuals residing near the mine and specifically the community of Bulga village. It was concluded that these impacts would exacerbate the loss of sense of place, and materially and adversely change the sense of community felt by the residents of Bulga and the surrounding countryside.

The SIA also details the socio-economic management, mitigation and enhancement initiatives currently implemented at MTW. These initiatives would continue under the current proposals. Additional project-specific initiatives are also proposed, namely:

- The development of a Social Impact Management Plan, to manage and monitor the implementation of strategies to reduce social impacts and enhance social opportunities

- The negotiation of a VPA with Singleton Council, which would include the dedication of funds to maintain and/or improve facilities and services in Bulga village, other local communities and the Singleton local government area as a whole
- The establishment of a “Near Neighbour Amenity Resource” to provide support to residents surrounding the mining complex.

These initiatives are all explained in detail in the SIA accompanying the EIS.

Many of the social benefits and impacts identified in the Applicant’s documentation were raised at the Public Hearing and in the written submissions received by the Commission. It is clear that there is a strong correlation between the social impacts associated with the proposal and the economic impacts, as factors such as property values and employment opportunities have flow-on effects to the wellbeing of the community.

The key concern of individuals and groups supporting the projects was that if they are not approved, there would be significant adverse social impacts on the community. A number of people supporting the projects described how residents and businesses in the Hunter are currently experiencing hardship as a result of a downturn in the coal market and a reduction in local employment opportunities. Therefore, the continuation of mining at Warkworth and Mount Thorley mines was considered by many to be a positive outcome for the region, as it would result in the following social benefits:

- The continuation of employment opportunities, which has positive impacts on economic activity, mental health and well-being
- Career and traineeship opportunities to local youth
- Stability within the community and wider region
- Ongoing vitality of local centres such as Singleton
- Indirect contributions, including local spending and reliance on local suppliers/industries
- Positive impacts on property values and saleability due to maintenance of local workforce
- Population stability
- Viability of community services
- Support for local charities, community and sporting associations.

Conversely, many community organisations and individuals expressed concern about the negative social impact of open-cut mining on rural communities, most specifically Bulga village. The main impacts raised at the Public Hearing and in written submissions are identified in Table 4, which also considers the Applicant’s response to these concerns.

Table 4 – Summary of social issues resulting from the projects and the Applicant’s response

Social impact	Assessment of impact by applicant ¹⁸
Population decline and loss of community and cohesion There is concern about the possible loss of population (including community leaders) resulting from land acquisition and relocation. This could lead to the gradual decline of the community, including facilities/services and existing connections and village life.	The applicant’s view is that the proposal would contribute to maintaining the current and regional population by continuing to provide employment opportunities. Subject to the implementation of management commitments made under the proposal, it is considered that the potential for loss of population, community members and leaders will remain relatively unchanged and, on balance, there will be limited social impact. These commitments include the establishment of a “Bulga and Near Neighbour Amenity Resource” to support residents surrounding the mines and the development of a social impact management plan to guide the implementation of the community initiatives identified in the SIA.
Stress and uncertainty Local residents have feelings of stress and uncertainty relating to the future of Bulga village, potential decline of community, property values and related impacts on investments/ assets.	The applicant explains that conversely, submissions from employees of the mine and supporting businesses commonly reference health impacts, such as stress related illnesses, due to the uncertainty regarding the mine’s future and job security. Subject to the implementation of all reasonable and feasible mitigation, the potential social impacts on health and wellbeing are considered to be acceptable and consistent with government policies and guidelines.
Impacts on infrastructure and social services Concern was raised regarding the medium to long-term viability of community facilities and services in Bulga village, including the Bulga Hall, tavern and store, as a result of proposal-related acquisitions and the associated relocation of residents. In addition, the removal of Wallaby Scrub Road may have a negative social impact in terms of lost local road connections and emergency vehicles access.	The applicant’s view is that the continued workforce of MTW and their families would help maintain the use of local businesses and services, particularly shops, services, schools and childcare facilities. The applicant is seeking to negotiate a VPA with Singleton Council, which would include public benefit contributions to be dedicated to maintaining and/or improving local facilities and services in Bulga village, other local neighbouring communities and the Singleton LGA as a whole. The Applicant’s response to the loss of Wallaby Scrub Road is provided under Section 5.9 of this report.
Solastalgia Solastalgia is described by Professor Glenn Albrecht (representing the BMDPA) as a “loss of place”. It is a condition caused by the gradual erosion of the sense of belonging to a particular place and a feeling of distress about its transformation. This will likely be experienced by residents of Bulga if the proposals are approved.	The potential for loss of a sense of place under the proposal is considered to remain acceptable. The predicted impacts are below the amenity criteria for a rural area and suggest that the mine and Bulga village can co-exist. If the proposal did not proceed, stakeholders residing in the Singleton local government area (and others areas where the existing level of social services could not be maintained) may experience a loss of sense of place.

¹⁸ EMGA Mitchell McLennan (EMM)(1), op.cit, Appendix M

5.2.2 Department's position

The Secretary's assessment considers the residual impacts of the Project against its social benefits, taking into account that the Project is required to facilitate the neighbouring Warkworth Continuation Project. The Department concludes that the Mount Thorley Continuation Project would result in significant social and economic benefits for both the local area as well as the State as a whole; and notes that many of the submissions received by the Department supported the Project, primarily due to its socio-economic benefits.

The Department shares the view of the Applicant that combined with the Warkworth Continuation Project, the Project would enable significant benefits to be realised. These benefits would outweigh the residual social costs of the Project for the local community. The Department is also satisfied that subject to the provision of a suitable VPA between the Applicant and Council, together with the funds committed by the NSW Government for the Singleton local government area, there will be a continued demand for community services and infrastructure created by the Project.

5.2.3 Commission's position

The Commission agrees with the LEC judgment that although the existing mining complex, along with the other mines in the area, have positive impacts (in particular in terms of employment in the community as a whole), mines also have negative social impacts on the local community. The positive and negative impacts can reasonably be expected to continue for the life of a mining project.

The Commission does not entirely agree with the Applicant's position that the Projects will not have a significant social impact on the health and wellbeing of the residents of Bulga. The Commission recognises that the expansion of the mining complex may result in a loss of community identity for Bulga village, due to the departure of existing residents who choose to move. This is likely to result in "solastalgia", as identified by Professor Albrecht at the Public Hearing.

Notwithstanding this, the Commission must balance the social impacts against the economic benefits associated with the proposal. In this regard, the Commission shares the Department's view that the impacts expected as a result of the Projects are acceptable when compared to the standards and performance measures commonly applied to mining projects in NSW. The continuation of operations and associated employment of approximately 1,300 employees will contribute to the vitality of centres such as Singleton, as well as a continued demand for community services and infrastructure in the area.

While the Commission supports the proposed socio-economic initiatives outlined in the SIA, it has also recommended that other options be considered for the existing residents of Bulga, as outlined in Section 5.1 above. They include compensating property owners, undertaking an enhancement strategy and program of works for Bulga village or even possibly relocating the entire village. The continuing encroachment of several surrounding mines on the village, and the possibility that further mining rights may be sought in the future, warrant serious consideration of this last option.

5.2.4 Summary

The Commission recognises that the Projects will result in adverse social impacts on the residents of the Bulga village. However, the Commission must balance this against the significant economic and social benefits associated with the proposal. The Commission supports the socio-economic initiatives

outlined in the SIA but considers that these initiatives should be augmented through the preparation of a Bulga Village Enhancement Strategy and a program of works to be undertaken by the Applicant. It also considers serious consideration be given to the option of relocating the village or compensating existing residents, as detailed in Section 5.1.

Additional social impacts associated with the proposal (such as dust, noise and visual impacts) are considered in separate sections of this report.

5.3 NOISE IMPACTS

5.3.1 Introduction

Noise impact on the Bulga village is one of the key issues raised in the Public Hearing and public submissions. The Commission notes that noise is a long-standing issue between the Mt Thorley Warkworth mining complex and the Bulga community.

Although the existing Warkworth and Mt Thorley mines have separate development consents with different noise limits, they have been operating as an integrated operation since 2004.

The 2010 Warkworth Expansion Project proposed to extend the open cut mining operations and increase the integration between the Warkworth and Mt Thorley mines. In assessing the 2010 application, the Department considered that the operation of the mine complex should be assessed as one operation to tighten the noise criteria for the complex as a whole. The continued operation of the complex under two separate noise criteria would allow higher noise levels from the complex as a whole than would otherwise be permitted if MTW was considered as a single complex.¹⁹

Noise impacts were a key reason for the refusal of the application by the LEC in 2013.

Since the court case, the NSW government has made a number of changes to the policy and legislation in relation to mining assessments. The key changes that are relevant for the consideration of noise impacts are:

Mining SEPP

The Mining SEPP was amended in November 2013 to set non-discretionary criteria for noise, air quality, air blast overpressure, ground vibration and aquifer interference. The criteria are said to be consistent with longstanding policies and guidelines. The Mining SEPP makes it clear that if the criteria are met, a proposal cannot be refused on those grounds.

Clause 12AB of the Mining SEPP is relevant for consideration:

12AB Non-discretionary development standards for mining

- (1) The object of this clause is to identify development standards on particular matters relating to mining that, if complied with, prevents the consent authority from requiring more onerous standards for those matters (but that does not prevent the consent authority granting consent even though any such standard is not complied with).

¹⁹ Major Project Assessment Warkworth Extension Project (09_0202), Director General's Environmental Assessment Report, October 2011, p.19

- (2) The matters set out in this clause are identified as non-discretionary development standards for the purposes of section 79C(2) and (3) of the Act in relation to the carrying out of development for the purposes of mining.
Note: The development standards do not prevent a consent authority from imposing conditions to regulate project-related noise, air quality, blasting or ground vibration impacts that are not the subject of the development standards.
- (3) Cumulative noise level
 The development does not result in a cumulative amenity noise level greater than the acceptable noise levels, as determined in accordance with Table 2.1 of the Industrial Noise Policy, for residences that re private dwellings.

The amenity criteria set out in the *NSW Industrial Noise Policy* (INP) that are relevant for the consideration of noise impacts on the Bulga village (i.e. rural residences) are shown in Table 5.

Table 5: Relevant amenity criteria in INP

Time of day	Recommended L_{Aeq} Noise Level dB(A)	
	Acceptable	Recommended Maximum
Day	50	55
Evening	45	50
Night	40	45

The Mining SEPP was further amended in December 2014 by the insertion of Clause 12A which requires the consent authority to consider any applicable provisions of the Voluntary Land Acquisition and Mitigation Policy (discussed in Section 2.3).

Voluntary Land Acquisition and Mitigation Policy

In relation to noise, the Voluntary Land Acquisition and Mitigation Policy describes the NSW Government's interpretation of the significance of any potential exceedances of the relevant noise assessment criteria, and identifies potential treatments for these exceedances²⁰.

Put simply, exceedance of 0-2dB(A) above the project specific noise level (PSNL) is considered negligible as it is not discernible and would not require any treatments or controls. Exceedance of 3-5dB(A) above PSNL is considered marginal/moderate and mitigation measures are warranted. Exceedance of 5dB(A) above PSNL is considered significant and mitigation measures and voluntary land acquisition rights should be provided²¹.

5.3.2 Issues raised in the Public Hearing and public submissions

The following is a brief summary of issues related to noise that were raised at the Public Hearing and in public submissions:

- The EIS did not consider the noise issues raised in the LEC judgment
- Background noise - questioned the levels identified in the EIS for the Bulga area and the 3dB(A) difference between two monitoring locations on Wambo Road when they are only 500m apart
- PSNLs should be set in accordance with the INP and at a level acceptable to the community - they should not be set at achievable levels
- The cumulative noise (log addition) of Warkworth (PSNL 38dB(A)), Mt Thorley (PSNL 38dB(A)) and Bulga (PSNL 35 dB(A)) is almost 42dB(A) which is above the amenity criteria

²⁰ NSW Government, *Voluntary Land Acquisition and Mitigation Policy – SSD Mining*, December 2014, p. 13

²¹ Ibid, p.14

- No noticeable operational noise improvements with the implementation of proactive and reactive noise management
- Past compliance record and current noise management process were questions, particularly the trigger action response
- Assessment and application of modification factor for low frequency noise (LFN) should be in accordance with the INP, not other methodologies/criteria
- It is not acceptable to wait for attended monitoring to confirm the community is impacted by LFN
- Sleep disturbance.

5.3.3 Noise matters raised in the LEC judgment

The BMPA contended that the EIS failed to address the noise matters raised in the LEC judgment.

The Commission notes that the issue was addressed in the *Mt Thorley Operations 2014 Response to Submissions, Volume 1 – Main Report, prepared by EMGA Mitchell McLennan*, dated November 2014 (RTS). The six key issues raised in the LEC judgment as identified in the EIS and RTS were existing noise levels, background noise, low frequency noise, residual level of noise impacts, cumulative noise and combined MTW noise criteria.

The following documents are of particular relevance in the Commission's review of the noise issue:

- *Noise and Vibration Study*, Appendix F of the Mt Thorley Operations 2014 Environmental Impact Statement (EIS), prepared by EMGA Mitchell McLennan dated June 2014
- Mt Thorley Operations 2014 RTS
- EPA's letter to the Department dated 13 August 2014 which provided comments on the Mt Thorley Operations 2014 Project development application
- The two court judgments
- The BMPA submission to the Department dated 20 August 2014
- *Acoustic Peer Review Mt Thorley and Warkworth Mine Continuation* prepared by Day Design Pty Ltd dated 6 August 2014
- The *Response to Noise and Vibration Issues* prepared by Day Design Pty Ltd dated 17 December 2014; and
- The Secretary's assessment report dated November 2014.

The Commission is satisfied that the issues raised in the LEC judgment have been adequately addressed based on the totality of the information available. The following sections of this report provide further discussion of the noise issue raised in the Public Hearing and submissions.

5.3.4 Existing and background noise levels

One of the key issues raised in the LEC judgment is the reliability of the adopted background noise levels. The background noise levels are very important because the PSNLs are generally set at 5dB(A) above the background noise levels in accordance with the INP.

Chapter 3 of the INP outlines the process to determine existing noise levels. It requires the assessment of existing noise levels that exclude all unusual extraneous noise, including the noise from the existing development that is now proposed to be expanded. A minimum of seven days of

monitoring data covering the days and times of operation of the development is required to establish the representative background noise levels for an area.

Section 8 of the *Noise and Vibration Study* considered the existing acoustic environment adjacent to the mine. According to the study, an extensive data gathering and analysis process was carried out. The results of six real time noise monitors were used to quantify the background noise levels in and around the Bulga village. The Barnowl loggers were used for directional filtering purposes. The data used for the analysis was collected between November 2012 and August 2013, a much longer period than the minimum of seven days required by the INP. Table 8.1 in the Study summarised its findings of the rating background levels (RBL) for Bulga village as follows:

Table 6: Representative background noise levels for Bulga (based on Table 8.1 in *Noise and Vibration Study*)

Location	Period (Duration)	RBL, dB(A)		
		Day	Evening	Night
A. Wollemi Peak Rd	20/06/13 – 14/08/13 (3 months)	33	33	34
B. 367 Wambo Rd ¹	01/12/11 – 29/11/12 (11 months)	30	33	33
C. 128 Wambo Rd	29/11/12 – 31/07/13 (8 months)	33	37	33
D. 193 Inlet Rd ¹	01/12/11 – 29/05/12 (6 months)	30	32	30
E. 229 Inlet Rd ¹	18/03/13 – 30/06/13 (3.5 months)	30	30	30
F. Scout Hall (putty Rd)	01/12/11 – 04/09/12 (10 months)	33	36	35
Notes: 1. Locations B, D and E data show RBL's at or below the INP minimum of 30 dB(A) for some assessment periods, and hence 30dB(A) was adopted as per the INP across all three assessment periods. 2. The RL is as defined in the INP, i.e. the median value of all ABLs. The ABL is also as per the INP, i.e. the lower 10 th percentile of L ₉₀ values.				

The *Noise and Vibration Study* reported that the six monitoring locations were well distributed across the Bulga area, hence provided representative data for all residences in the area (see Figure 3).

Objectors also questioned why there is a 3dB(A) difference in the RBL between Monitoring Locations B and C when they are only 500m apart.

The EPA in its letter to the Department dated 13 August 2014 did not raise any concern about the *Noise and Vibration Study* reported background noise levels. However, it noted that the potential noise impacts associated with the upgrading of the CPP has not been discussed. The Commission considers that this issue should be considered prior to determination of the application.

The Secretary's assessment report considered the background noise levels (page 30). The report stated that both the Department and the EPA have examined the *Noise and Vibration Study* results closely, and are satisfied that accurate background noise levels have been established for the surrounding areas.

The Department also engaged an independent noise expert (Dr Norm Broner) to review the various aspects of the noise impacts of the proposal. The Commission is advised that Dr Broner is satisfied with the adopted background noise levels.²² However, Dr Broner's report is not yet available for review by the Commission.

²² Department of Planning and Environment Memorandum – Response to PAC request for information dated February 2015

The Commission finds the noise environment of the Bulga area has changed over time due to the operations of other mines in the locality including the Bulga open cut and underground complex to the south, the Wambo open cut and underground complex to the north east and the Hunter Valley Operations South complex to the north. The LEC judgment also acknowledged the changing nature of background noise in the area.

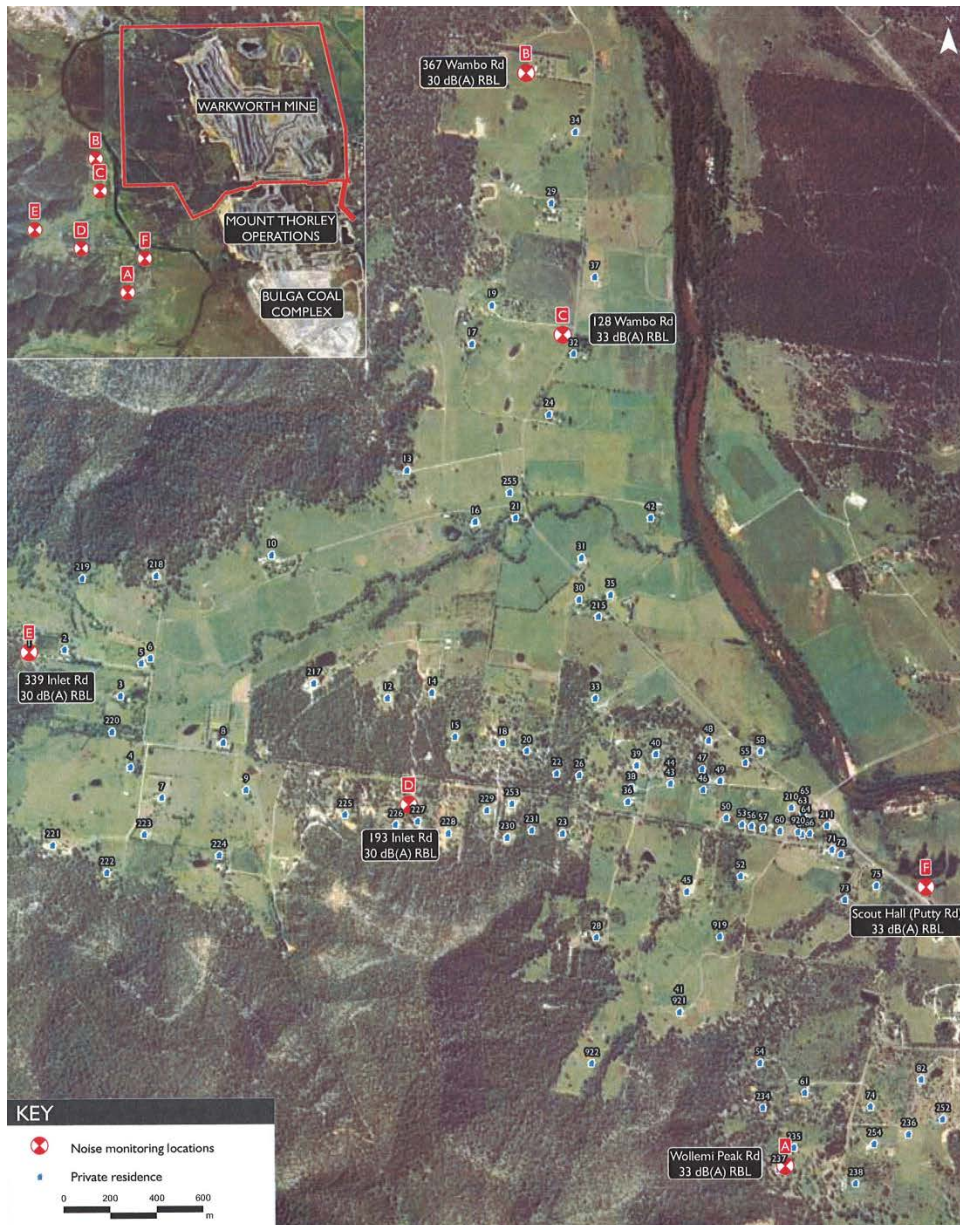


Figure 3: Long-term background noise monitoring locations in Bulga (Source: Figure 8.1, Noise and Vibration Study)

For Hambledon Hill, Gouldsville, Long Point Road and Warkworth Village the Study adopted the historic RBL values in the Warkworth EIS 2002, i.e. between 30 and 33dB(A). For residences of Maison Dieu to the north of the Mt Thorley Operation, 30dB(A) was adopted in the absence of suitable long term monitoring data.

A small group of residences adjacent to the Mt Thorley Industrial area to the south of the Warkworth mine are currently affected by the industrial area, Mt Thorley coal loader and associated rail operations. Some of the residences have existing acquisition rights due to impacts from other mines.

The BMPA contended that the Bulga open cut EIS reported the background noise level for Bulga village was 29dB(A). The 2002 background noise reported by the Applicant for the existing mine included noise from the operations of the Warkworth and Mt Thorley mines. If these operations were excluded, the background noise level of Bulga village would be lower. Therefore the background noise level for Bulga should be 30dB(A), not 30-33dB(A).

The BMPA's independent consultant (Day Design) considered that the background noise for 98 Wollemi Peak Road (Location A) should be 30dB(A) based on its monitoring results, not 33dB(A) as indicated in the EIS. The consultant further pointed out that the background noise level for locations C and F should be verified by an independent expert.

As to the question of the 3dB(A) difference between Locations B and C, the Commission finds ideally the monitoring period of adjacent stations should have at least had some overlapping duration to provide a better picture of the acoustic environment for the area, when the monitoring results from different time periods indicate a noticeable difference between locations in close proximity.

In this case, it is noted that the monitoring was carried out broadly over two periods. The first period was between December 2011 and November 2012 which involved three monitoring stations, namely Locations B, D and F. Although their monitoring duration varied, there were some overlapping periods. The distribution of the stations was well spread out in the Bulga area. (See Figure 3)

The second monitoring period was between January 2013 and August 2013 and involved three different monitoring locations, namely Locations A, C and E. These monitoring stations were again well distributed in the Bulga area and had some overlapping periods.

These monitoring results appear to be supported by the SKM monitoring report in 2012 that the background noise levels in the area are generally between 30-33dB(A).

On the evidence, the Commission finds the data gathering process and the quantity of data collected for the assessment of background noise levels is adequate and consistent with the INP requirements. The locations of the monitoring stations were well distributed in the Bulga area, thus providing appropriate representative information.

Recommendation

1. The potential noise impacts associated with the upgrading of the CPP should be addressed prior to the determination of the application.

5.3.5 Noise criteria

Objectors argued that the PSNL for Bulga should be 35dB(A) and not 35-38dB(A) as proposed in the EIS. They expressed the view that the PSNL should be set in accordance with the INP and that noise criteria should be set at levels that are acceptable to the community, not at what is achievable. They disagreed with the statement that Bulga generally has a rural level of amenity as per the INP and argued that the noise from the four mines surrounding Bulga is an intrusion for a rural community. They also questioned the cumulative noise of Warkworth, Mt Thorley and Bulga when their respective PSNLs are 38dB(A), 38dB(A) and 35dB(A). The log addition of these levels is a noise level close to 42dB(A), which is above the amenity criteria.

Section 2.1 of the INP provides the procedures to establish two sets of noise criteria. The objects of these criteria are to control the intrusive noise impacts in the short term for residences and to maintain an acceptable noise amenity for residences within an area affected by industrial noise sources.

The intrusive noise criteria are set at 5dB(A) above the rated background noise levels, whereas Table 2.1 in the INP provides the relevant amenity criteria for residences and other sensitive facilities on different types of land uses (refer Table 5 herein).

It is important to note that some people in the community are more sensitive to the change of noise levels. The criteria set in the INP aim to protect 90% of the population over 90% of the time. Therefore, meeting the INP criteria does not mean all the population in a community will be protected. Section 1.4.1 of the INP makes it very clear that provided the criteria in the document are achieved, it is unlikely that most people would consider the resultant noise level excessive.

Although the Commission is sympathetic to the changing noise environment in the Bulga area over time, it is bound to give significant weight to the current applicable government policies and the advice from the EPA in its review of the current application given the EPA is the lead authority in the assessment of noise impact and regulating noise from industrial sources.

Project Specific Noise Level

As discussed in the previous section of this report, the Commission finds the EIS and the *Noise and Vibration Study* reported background noise levels for Bulga of between 30 and 33dB(A) reasonable. Therefore, the setting of the intrusive noise levels (PSNLs) between 35 and 38 dB(A) are in accordance with the INP, i.e. background level plus 5dB(A). It is also noted that the INP states that project specific noise levels should not be 'automatically interpreted as conditions for consent, without consideration of other factors,' and 'in many instances, it may be appropriate to set noise limits for a development above the project specific noise levels'²³.

The Commission notes that some of the noise limits set in the draft conditions are above the PSNLs and are the predicted mine operational noise levels. In setting these limits, mitigation and acquisition rights would be provided to those properties with noise levels, as predicted, above the PSNL in accordance with the government's interpretation of acceptability of impacts. For example, the PSNL for property number 18 is 36dB(A). The noise limit for this property is set at 37dB(A) in the draft conditions. That is 1dB(A) above the PSNL. The predicted exceedance of 1dB(A) is considered negligible according to the relevant policies.

²³ EPA, *NSW Industrial Noise Policy*, Sydney, 2000, p.6

The Commission notes the community's view on the acceptability of setting the noise limits above the PSNL. However, it is a policy matter that should be discussed in the broader policy setting environment such as the review of the INP.

Recommendation

2. The acceptability of setting noise limits above the PSNL should be considered by the NSW government, ideally via a review of the INP.

Cumulative Noise and Amenity Criteria

Section 11 of the *Noise and Vibration Study* provides an assessment of cumulative noise from all industrial sites (including Wambo mine, Hunter Valley Operations South mine, Mt Thorley mine, Bulga mine and to some extent the Redbank Power Station). The assessment concluded that the night-time amenity criteria are satisfied at most locations. The exception is Location 77 which is entitled to acquisition rights upon request from a neighbouring mine. The amenity criteria are likely to be exceeded at two other locations (102 and 264) due to the Wambo mine.

The EPA's submission to the Department dated 13 August 2014 raised an issue that the *Noise and Vibration Study* in its assessment of cumulative noise seems to include the noise of the subject mine which appears to be inconsistent with the INP methodology. However, the EPA concluded that the use of intrusive criteria is appropriate as the PSNL would not change if the inconsistency is corrected.

The Commission understands the INP requires that both the amenity and intrusive criteria are satisfied and the more limiting criterion becomes the PSNL. The Commission has also been advised that to breach the amenity criteria, the mine must first breach its intrusive criteria.

5.3.6 Exceedances of noise criteria

The community raised two issues in relation to exceedances of the noise criteria. The first issue relates to compliance with existing noise limits which gives rise to the lack of confidence in the mine's ability to meet the noise criteria if the current application is approved. Despite MTW's claimed compliance, the objectors cite their own monitoring results as proof. This issue is discussed in section 5.3.9 of this report.

The second issue relates to the predicted exceedances and the acceptability of these exceedances. The predicted exceedance of noise criteria is a key concern to the community. Some objectors are of the view that plant and equipment should be shut down to reduce noise impact if exceedance occurs.

Section 9.4.2 of the Mount Thorley EIS discussed the assessment of operational noise and Table 9.6 therein summarised the extent of the predicted noise exceedance above PSNL. The Secretary's assessment report summarised the predicted noise impacts of the project at privately owned residences as follows:

Table 7: Predicted noise impacts (No. of privately owned residences)

PSNL(dB)	≤PSNL	+ 1-2dB	+ 3-5dB	>5dB
35	116	12	2	1
36	1	8	-	-
37	5	12	-	-
38	38	21	-	1
Total	160	53	2	1 ^a

Note: a. Excludes 3 properties in the existing acquisition zone.

In considering whether the predicted exceedances are acceptable, the Commission must take into account the current applicable government policies, particularly the Mining SEPP amendments made in 2013 and 2014 (discussed in Section 2.3 of this report). Based on the Government's interpretation, exceedances of 1-2dB(A) are considered negligible as they are not discernible by the average listener and therefore do not warrant any treatments or controls. Exceedances of 3-5dB(A) are considered as marginal/moderate and mitigation measures should be provided. Exceedances over 5dB(A) are considered to have significant impact and mitigation measures should be provided and voluntary land acquisition rights should only apply as a last resort.

The Commission is sympathetic to the community's view on predicted exceedances and this issue was raised in previous Commission review/determination reports. However, the Commission must consider the application in accordance with the relevant government policies. The Commission finds the Department's assessment of the noise exceedances and recommended treatments to predicted exceedances on residences are consistent with the current applicable government policies. As mentioned earlier, the INP review process is the best avenue to discuss the community's view on acceptability and appropriateness of noise exceedances.

5.3.7 Noise management measures

To minimise noise impacts of the mine operation, the Applicant proposes to implement all reasonable and feasible noise mitigation measures. These include the completion of the attenuation program for mine fleet and equipment by the end of 2016, the implementation of best management practice and a proactive and reactive noise management system on the mine site.

The *Noise and Vibration Study* devoted a significant part of the study (Chapters 3 to 5) to outline the current acoustic management system including administrative controls, substitution controls, engineering and elimination controls. It also detailed the Applicant's commitment to continuous improvement by working towards implementing a predictive modelling interface and alternative real-time noise monitoring technology.

The EPA in its submission to the Department advised that it is of the view that the proposed noise mitigation measures reasonably represent current best practices at similar mines. The EPA considers it is unlikely that there are further feasible and reasonable measures that would provide significant additional noise mitigation.²⁴

The Secretary's assessment report also concluded that the Applicant is implementing best management practice on site. The Commission agrees that the proposed noise management measures, if implemented and applied correctly, would represent best management practice. It is therefore important to ensure these measures are implemented and their performance is monitored.

The Commission considers that there is also a need to clarify the confusion in the community in relation to the operation of the Trigger Action Response Plan and at what noise level the trigger is activated. A public information briefing session is recommended.

²⁴ Attachment 3 to the EPA letter to the Department of Planning and Environment dated 13 August 2014

Recommendation

3. A public information briefing session should be held to clarify the operation of the Trigger Action Response Plan.

Current attenuation program

Although the approval of the 2010 application is not a relevant consideration of this application, the Commission notes that one of the approval conditions required all fleet to be attenuated by 2015 to reduce noise impacts. It is therefore a disappointment to the Commission that only 50% of the haul truck fleet has been attenuated and the remaining trucks are now expected to be attenuated by the end of 2016. The Commission understands that the program to attenuate all the mining fleet of dozers, excavators and drills will continue and is also expected to be completed by the end of 2016.²⁵

The Commission sought additional information to justify why it is not reasonable and feasible to accelerate the proposed attenuation program of the mining fleet and equipment. The Applicant advised that the ongoing operation relies on the use of the existing fleet. The noise attenuation packages are not available off the shelf and are retrofitted at the Mt Thorley Operations workshop. It takes two to four weeks to retrofit each item of equipment on average, depending on condition and age. The program also includes the use of off-site facilities where cost effective to expedite the program. The attenuation programme is scheduled progressively, prioritising attenuation on the loudest trucks first and ensuring operations are managed using fleet that has been attenuated in more exposed areas.²⁶

In response to the Commission's question of cost and benefits of accelerating the attenuation program, the Department advised that the current attenuation program would cost in excess of \$30 million, and the acoustic benefits of accelerating the program would be limited. It considers that the costs of accelerating the attenuation program outweigh any benefits that may be realised. It is also important to note that the Department has recommended stricter noise limits once the attenuation program is complete (i.e. from January 2017)²⁷.

Voluntary Land Acquisition and Mitigation Policy

As outlined above, the Commission recognises that the approval of the 2010 application is not a matter for its consideration in this review. However, given the history of this project and the ongoing noise concerns of the community, the Commission notes that the LEC judgment has created an anomaly in terms of the number of properties that would be offered mitigation rights and acquisition rights if the subject application is approved. The current project would result in significantly less properties having access to these options than the previous approval. This is primarily due to the separating out of the two applications. The Commission is of the view that this is a significant issue that needs to be addressed.

It is noted that the Applicant in its RTS (p.134) committed to honouring the voluntary acquisition rights granted to some residents under the now rescinded planning approval for the Warkworth Extension 2010 project subject to approval of the current application. The Commission sought the Department's advice as to the best way to formalise this commitment and whether this commitment should be extended to the rights to mitigation measures provided in the previous approval.

²⁵ EMGA Mitchell McLennan (EMM)(4), *Warkworth Continuation Project 2014 Environmental Impact Statement*, Sydney, 2014, p.153

²⁶ RioTinto letter to the Department of Planning and Environment dated 10 February 2015.

²⁷ Department of Planning and Environment Memorandum dated February 2015

The Department advised that the allocation of mitigation and voluntary acquisition should be carried out in accordance with the Voluntary Land Acquisition and Mitigation Policy. There are uncertainties in the Applicant's commitment to honour the previous acquisition rights as no details have been provided. The Department considers these rights, if they were to be provided, should not be confused with the rights provided under the Voluntary Land Acquisition and Mitigation Policy.

The Commission agrees that these commitments are a social contract between the Applicant and the relevant land owners/community and not a regulatory obligation. In the Commission's view, if the Applicant is genuine about its commitment to honour the voluntary acquisition rights granted to some residents, the commitment should be extended to mitigation rights and that these commitments should be included in an updated Statement of Commitments. These rights should be provided in similar terms and conditions to those granted under the consent conditions.

Recommendation

4. The Applicant should update its Statement of Commitments to provide acquisition and mitigation rights to those properties which were granted such rights under the now repealed approval. The terms of these rights should be similar to those that would be granted under the recommended draft conditions.

5.3.8 Noise monitoring and compliance

The BMPA directed attention to the LEC judgement which raised the following key issues in relation to noise monitoring and compliance:

- Past attended monitoring has been at too few locations on too few occasions
- Even attended monitoring will have difficulty in distinguishing the source of noise generated
- It is likely to be difficult to monitor or enforce compliance.

Accordingly, the judgment found that no confident conclusion could be drawn that the noise impacts of the project will be acceptable.²⁸

Some Bulga residents raised concern that the four Barnowl directional monitoring devices located in Bulga appeared to be highly inaccurate when their recorded results were compared with those obtained by the community. BMPA directed attention to recent complaints about the effectiveness and quality of the current noise monitoring system, particularly the differences of noise measuring results between the Applicant's results and the residents' records.

The Commission notes noise monitoring and compliance of noise limits are issues raised regularly in public submissions and at the Public Hearing. However, the Department has advised that 'in NSW only attended monitoring can be used to monitor compliance with noise limits under planning approvals and environmental protection licences'.²⁹ Other monitoring types (real time/directional monitors or residents' handheld monitors) have technical issues that render their results not suitable for prosecution of non-compliance. The main purpose of real time monitoring and directional monitoring is to trigger reactive noise management at the mine.

The Department acknowledged that the distinction between the two types of noise monitoring carried out at mines, and the purpose for which they are carried out, is not well understood within

²⁸ Bulga Milbrodale Progress Association Inc letter to the PAC dated 19 January 2015

²⁹ Department of Planning and Environment Memorandum dated February 2015

the broader community and commonly leads to confusion, particularly when people try to judge the compliance of mines by interpreting the real time noise monitoring results. In recent consents, the Department has required mining companies to try to improve the calibration between attended and real time monitoring results, so the real time monitoring results can become a better indicator of compliance and trigger further attended monitoring. However, this work is still in its infancy and could take several years before it can be used effectively.³⁰

The Commission agrees and considers an information forum should be arranged to brief the community on the issues that have created confusion and misunderstanding including the application of the LFN modification factor and the purposes of different types of monitoring, and the Trigger Action Response Plan.

As to the question about the Applicant's compliance record, the Commission notes in 2012 the Department engaged SKM to conduct an independent monitoring program to assess the impact of mine noise from the Mt Thorley Warkworth mine complex. A monitoring and assessment program was established in conjunction with members of the Bulga community. In total eight monitoring locations were selected to represent the wider Bulga area.³¹

The monitoring program lasted eight weeks, and consisted of attended and unattended noise monitoring at several locations. From 72 monitoring events, a single exceedance of the noise criteria was observed at the Warkworth coal mine. Further assessment using the results from continuous directional monitoring indicated 13 probable exceedances from the Warkworth mine over a two month period and a single exceedance as a result of noise from both mines. No exceedances were longer than an hour and all were 10dB or below. Low frequency noise impacts were considered to be significant at two locations, and moderate at two further locations.

The SKM report found the operations generally complied with the noise conditions noting that some locations may be impacted by LFN at night. The report also identified that insufficient data was collected to enable it to assess the accuracy of ongoing routine noise monitoring carried out by the Applicant. This issue appears not to have been addressed in the information before the Commission and should be addressed before the determination of the current application.

To address residents' complaints of non-compliance and the issues raised in the LEC judgement, the draft recommended conditions provided by the Department include a significant increase in compliance monitoring (attended monitoring) requirements to at least 12 times a year in accordance with the INP. The Commission supports the conditions.

Recommendation

5. The recommended public information briefing session referred to in Recommendation 3 should include a briefing on the application of the LFN modification factor and the purposes of different types of monitoring as well as the operation of the Trigger Action Response Plan.
6. The concerns raised in the SKM report that insufficient data was collected to enable it to assess the accuracy of ongoing routine noise monitoring carried out by the Applicant should be addressed before determination of the current application.

³⁰ *ibid*

³¹ Sinclair Knight Merz, *Mount Thorley/Warkworth Coal Mine Independent Noise Monitoring Report*, 30 April 2012

5.3.9 Low frequency noise

The *Noise and Vibration Study* considered three different methods of assessment of LFN, including the INP method, the Broner method and the UK Department of Environment, Food and Rural Affairs method. Objectors contended the application of the INP method to the 2013 monitoring results indicated exceedances occurred and the INP penalty should apply. They argued that it is not acceptable to discount the LFN modifying factor and that to use the Broner method to assess and forecast adjustments to account for the impact of low frequency noise is not acceptable as this is not a recognised method of assessment. They argued that the 5dB(A) low frequency penalty should be applied to the predicted noise levels and that consequently the predicted cumulative noise levels for the Inlet Road west and Long Point will increase to well above INP noise criteria and are thus considered unacceptable.

The Commission noted Section 4.2.3 of the 2012 SKM monitoring report summed up the issues in relation to the application of the LFN in accordance with the INP as follows:

- The 15dB(A) difference between the A and C weighted noise as described in the INP can often be a feature of many natural environments
- Due to the increased attenuation rate for higher frequencies when compared to lower frequencies, any noise spectra may be dominated by lower frequencies at larger distances in such a way as to unjustly qualify for the 5dB(A) low frequency penalty
- The original intention of the modification factor was to assess noise sources at close range for low frequency characteristics rather than at large distances
- The influence of other sources of LFN in the background noise.

The EPA in its submission to the Department advised that the former Department of Environment Climate Change and Water (DECCW) in December 2010 expressed the view that 'it agreed with the Department of Planning that the INP Low Frequency Noise (LFN) modification factor would be applied except where it is shown that it results in perverse outcomes'. The EPA further advised that it 'proposes to apply the methodology for LFN in Table 4.1 of the INP unless further information is provided'.

In response to the EPA's comments, the RTS pointed out that the current INP's technical definition of LFN does not align with the community's perception of LFN. It also raised similar issues in relation to the application of the LFN as identified in the SKM report.

The Department's noise expert also pointed out issues similar to those identified in the SKM report. In particular, he noted that the penalty does not apply to general noise or the predictions and must be applied specifically to a noise source. He also noted the additional analysis carried out by the Applicant's consultant, which supported the earlier findings that the penalty should not apply. The Department accepted the advice.

The Commission agrees with the EPA and community that the current INP methodology should apply, not the alternative methods proposed by the Applicant. There is confusion in the community in terms of LFN assessment methodology and the application of the modification factor. As recommended above, a public information forum may assist in clearing the confusion.

Recommendation

7. The conditions in any approval should require the application of an appropriate noise modification factor for LFN during compliance testing if LFN is prevalent before comparison

with the PSNL in the approval. However, if a new INP is adopted before the determination of this application, the new INP methodology and criteria should apply.

5.3.10 Blasting

Singleton Council raised two issues in relation to blasting impact. Firstly, best practice blast management should continue to be implemented and be incorporated into any consent conditions. Secondly, an online blast schedule should be provided and updated regularly.

The BMPA raised concerns that the blast study was undertaken without consultation and without reference to the site management plan and is inconsistent with contemporary limits. It further contended that road closures are random in nature and will increase the vibration and damage from blasting.

The Department accepted that with the implementation of standard blasting conditions, the Applicant could be able to comply with the relevant ANZEC criteria. It has recommended draft conditions requiring the applicant to:

- Prepare and implement a blast management plan that includes a monitoring program for evaluating the performances of the development
- Manage blasting operations to comply with all relevant criteria at private properties
- Limit blast frequencies to a maximum of two blasts a day and six blasts a week averaged over a year, and blasting hours between 7am and 5pm
- Provide structural property inspections and investigations for private residences (upon request) within two kilometres of the project blast area.

The Commission considers the issues have been adequately assessed in the Secretary's assessment report and that the recommendations are reasonable. Up-to-date information regarding blasting operations and schedule, and feedback/complaint management should be provided on the Rio Tinto website.

Recommendation

8. Up-to-date blasting operations and schedule, and feedback/complaint management should be provided on both the Rio Tinto website and hotline.

5.3.11 Summary

In relation to the significant issue of noise, the Commission considers the evidence indicates that

- The relationship between the Applicant and the Bulga community has deteriorated to the level where constructive discussion to resolve issues of significant concern to the community is difficult, particularly in terms of monitoring and compliance
- There is confusion and misunderstanding in the community in relation to the application of the INP, the purposes of different types of monitoring and validity of these results for non-compliance prosecution, and the trigger action response process, particularly whether the trigger level is set at or below the noise limit
- The Applicant has not demonstrated it is able to counter the community's scepticism and lack of confidence in its ability to comply with the existing and proposed noise criteria if the project is to be approved.

The Commission considers it is of critical importance that the Applicant attempt to improve its relationship with the community so as to rebuild confidence and trust. Engaging an independent mediator may assist in this rebuilding process.

As a first step towards reconciliation, the Applicant should genuinely commit to honouring the acquisition and mitigation rights provided to the residences that were granted such rights under the now repealed approval. These rights should be included in an updated Statement of Commitments and the terms of these rights should be similar to those granted under the draft recommended conditions.

The EPA's review of the Noise and Vibration Study concluded that it can support the project based on predicted noise levels in the study and draft recommended conditions. Given the EPA is the lead authority in noise assessment and regulating noise from industrial sources, significant weight should be given to its advice.

The Secretary's assessment report has adequately addressed the issues raised in the public submissions and its recommendations are consistent with current government policies.

Many issues raised in the objection submissions are broad issues relating to the INP (i.e. acceptability and appropriateness of criteria, low frequency noise, monitoring and compliance) and should be canvassed in a review of the INP.

Other findings of the Commission are:

- The noise issues raised in the LEC judgment have been adequately addressed based on the totality of evidence before the Commission
- The data collection, analysis and assessment of the background noise levels for the Bulga area are consistent with the INP requirements
- The noise criteria in the draft conditions take into account the Mining SEPP and the Voluntary Land Acquisition and Mitigation Policy
- Predicted noise exceedances have been dealt with in accordance with the Mining SEPP and the Voluntary Land Acquisition and Mitigation Policy
- The unintended consequence of the 2013 LEC judgment is a significant reduction in the number of properties that will be provided with mitigation or acquisition rights, if the subject application is approved
- The commencement of any new consent should trigger the application of the new noise criteria
- The 2012 SKM monitoring report found the mine generally complied with its current noise limits, noting that some locations may be affected by low frequency noise
- Low frequency noise is a significant issue to the community. The INP methodology should apply and not other alternative methods. During compliance testing, if low frequency noise is prevalent, an appropriate noise modification factor should apply before comparison with the noise criteria in the approval is made
- Other noise issues including sleep disturbance, vibration, health impact, traffic noise and rail noise have been adequately addressed in the EIS, Noise and Vibration Study and the Secretary's assessment report.

Recommendations

1. The potential noise impacts associated with the upgrading of the CPP should be addressed prior to the determination of the application.
2. The acceptability of setting noise limits above the PSNL should be considered by the NSW government, ideally via the review of the INP
3. To ensure the benefits of the attenuation program will be fully realised, regular monitoring and audit of the performance of the attenuated fleet and equipment should be carried out
4. A public information briefing session should be held to clarify the operation of the Trigger Action Response Plan
5. The Applicant should update its Statement of Commitments to provide acquisition and mitigation rights to those properties which were granted such rights under the now repealed approval. The terms of these rights should be similar to those that would be granted under the approval conditions should the application be approved
6. The recommended public information briefing session referred to in Recommendation 3 should include a briefing on the application of the LFN modification factor and the purposes of different types of monitoring as well as the operation of the Trigger Action Response Plan
7. The concerns raised in the SKM report that insufficient data was collected to enable it to assess the accuracy of ongoing routine noise monitoring carried out by the Applicant should be addressed before determination of the current application
8. The conditions in any approval should require the application of an appropriate noise modification factor for LFN during compliance testing if LFN is prevalent before comparison with the PSNL in the approval. However, if a new INP is adopted before the determination of this application, the new INP methodology and criteria should apply
9. Up-to-date information should be provided on both the Rio Tinto website and hotline with respect to blasting schedule and feedback/complaint management.

5.4 VISUAL IMPACTS

5.4.1 Introduction

Members of the public and community interest groups in the written submissions and at the Public Hearing raised significant concerns regarding the visual impact of the proposed expansion of the mining complex. The focus of the concern was on the visual impacts of the mine expansion on Bulga village, particularly given the proposed removal of Saddleback Ridge, which has provided an important visual barrier between a number of residences and the mine. While the Commission recognises that Saddleback Ridge does not strictly form part of the Mount Thorley operations, the two mines are integrated in terms of infrastructure and rehabilitation. Therefore, the visual impact assessment below considers the mining complex as a whole.

5.4.2 Existing visual landscape

As part of the EIS, the Applicant submitted a Visual Impact Assessment prepared by Integrated Design Solutions³². This study provides a detailed description of the landscape character of the local

³² Integrated Design Solutions, *Mount Thorley Operations 2014 Visual Impact Assessment*, Sydney, 2014

area surrounding the mining complex, which generally comprises moderate to gently sloping hills, with several locally dominant ridges.

The Mount Thorley mine is mainly shielded from view on three sides by the Warkworth mine to the north, the Mount Thorley Industrial Estate and hills to the east, and the Bulga mine to the south. Saddleback Ridge is located approximately 4.5 kilometres northeast of Bulga village and 650 metres east of Wallaby Scrub Road (see Figure 4). The ridge currently screens parts of the Warkworth operations from Bulga village, although several properties in the village have direct views of the Mount Thorley and/or Bulga mining operations. These mines are particularly visible from the elevated foothills of the village, but are mitigated to some extent by the distance between the village and the mining operations (approximately three kilometres). The mining complex is not visible from Singleton or Broke due to the topography of the area.

5.4.3 Expected visual impacts

The two projects will alter the existing landscape of the mining complex as a result of the following works:

- Expansion of the Warkworth mine through Saddleback Ridge. The eastern sections of the ridge are expected to be removed in the third year of the mine life, and by the ninth year the parts of the ridge located within the proposed extension area would be completely removed
- Advancement of the North and West pits of Warkworth mine in a westward direction
- Continuation of the existing overburden emplacements in a westward direction
- Establishment of a third crossing (underpass) of Putty Road between Warkworth mine and Mount Thorley mine
- Construction of a bund adjacent to the northern side of Putty Road
- Continuation of night lighting at Mount Thorley on overburden emplacement areas and mining equipment.

The Visual Impact Assessment concludes that the potential visual impacts associated with the Mount Thorley Continuation Project would generally be low although some sensitive assessment locations may experience higher impacts. These impacts will generally be on areas to the west of the mine, including a limited number of residential properties around Bulga village.

In terms of the mining complex as a whole, the impact on properties within Bulga would be dependent on the position of the viewing location, the orientation of the property and the extent of any intervening screening provided by vegetation. Some parts of the village would experience low impacts, while some properties in elevated locations (such as those on parts of Inlet Road) will potentially experience high impacts. The visible elements of the mining complex from Bulga village will be the overburden emplacements associated with the Warkworth extension, which would be located approximately four to five kilometres from the village. In some areas the emplacement would be 190 metres AHD, which is a significant increase of around 30 metres AHD over existing heights. Night time lighting would potentially also cause additional visual impacts.

5.4.4 Mitigation measures

The Visual Impact Assessments for the Mount Thorley and Warkworth Continuation Projects recommend a range of management and mitigation measures to minimise the visual impacts of the proposals.

For residences within the primary visual catchment expected to experience high impacts, the Applicant has indicated that mitigation measures would be implemented (subject to agreement with landowners). They are likely to constitute vegetation screening and/or other property-specific measures. In addition, the Applicant has offered all residences in elevated locations in Bulga village the opportunity to request a site-specific visual assessment to determine the severity of the visual impact of the mining complex. This assessment would be conducted by the Applicant and would suggest to affected residents the location and type of screening that might be required to minimise the impact from each property.

The Applicant's view is that following the implementation of appropriate visual mitigation measures, the visual impact for affected residences would be reduced to low or acceptable levels, as demonstrated in the Visual Impact Assessment.

5.4.5 Department's position

The Department acknowledges that the two projects would result in increased visual impacts for a number of residences in Bulga village and surrounds, and that in some cases there would be some unavoidable residual impacts.

The Mount Thorley Continuation Project would generate continued and potentially increased night lighting impacts on the surrounding area. In addition, the progressive backfilling of existing voids will create new landforms, including a narrow valley leading to a large final void. The Visual Impact Assessment shows that the new landforms would be visible from large parts of Bulga village. While these views would be mitigated in the medium to long term as the landforms are shaped and revegetated with woodland, the Department recognises that there is very little that could be done in the short to medium term due to the natural topography of the area. Notwithstanding this, the Department considers the proposed final landform to be a significant improvement to the current approved final landform of the mine.

Overall, the Department considers that the residual visual impacts of the project would be acceptable, subject to conditions. These include:

- Implementation of all reasonable and feasible measures to minimise the lighting impacts of the project
- Ensuring that all external lighting complies the relevant Australian Standard
- Monitoring and reporting on the effectiveness of these measures.

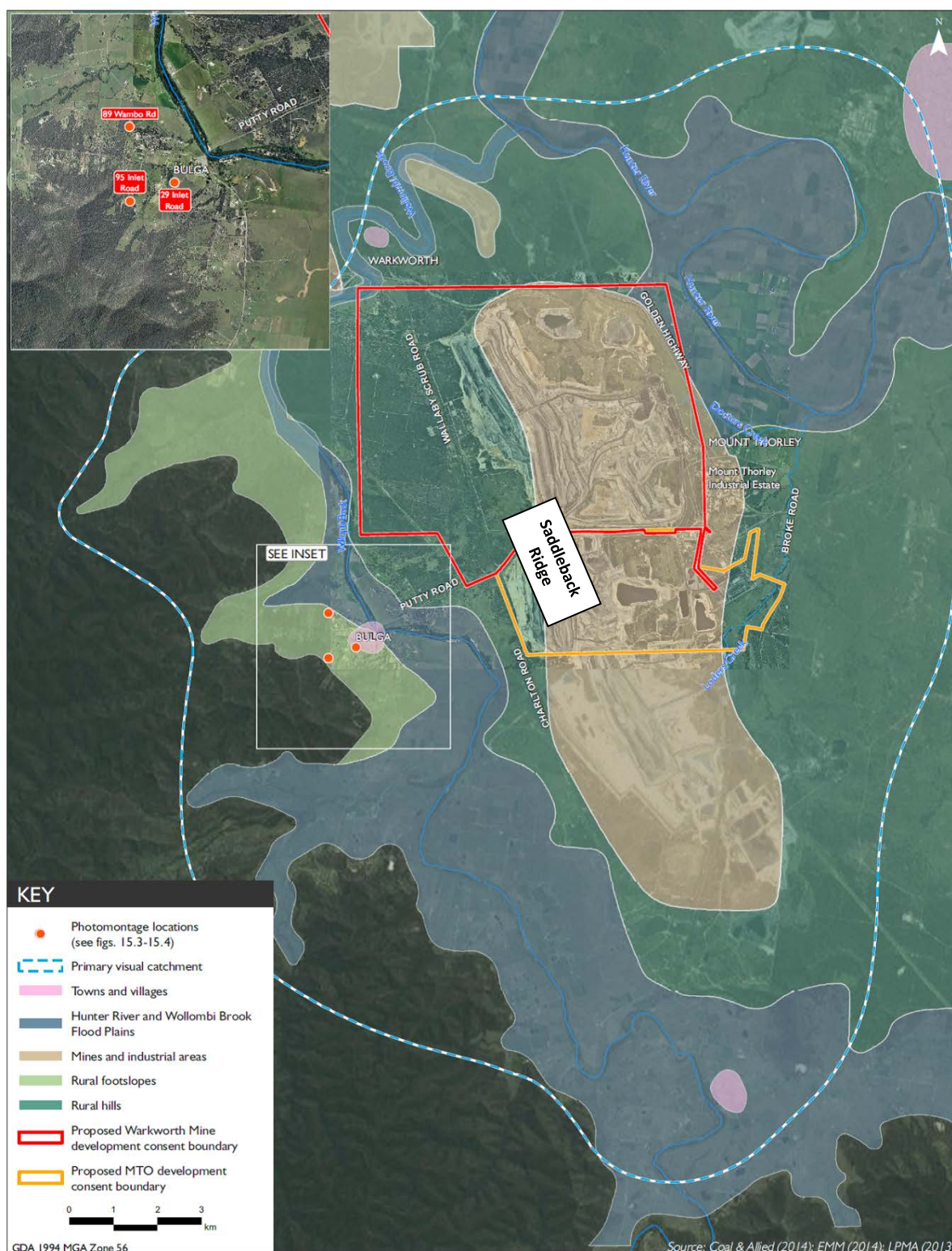


Figure 4: Characteristics of the site and surrounding landscape, including the location of Saddleback Ridge (source: Secretary's assessment report, 2014)

5.4.6 Summary

The Commission appreciates the views expressed by individuals and public interest groups regarding the visual impacts associated with project. The Commission has visited the site and surrounding area, including Bulga village. During this visit it was observed that much of the existing outlook from the village to the east and southeast contains views of the existing Mount Thorley and Bulga mines.

The Commission recognises that the two projects would permanently change the visual outlook from parts of Bulga village. However, on balance it is concluded that the visual impacts would either be acceptable or could be minimised by the proposed measures and draft recommended conditions. The Commission acknowledges that the local community of Bulga may view this as a subjective judgement.

Nevertheless, the Commission considers there are limited grounds to refuse the proposal based on the anticipated visual impacts, especially given that the impacts can be substantially mitigated.

The Commission's consideration of the visual impacts associated with the Warkworth Continuation Project, including the removal of Saddleback Ridge, is considered in the Warkworth Review Report.

5.5 AIR QUALITY

5.5.1 Introduction

Air quality has been raised as a concern in both the Public Hearing and submissions in relation to the Mount Thorley Continuation Project. Particular concerns raised relate to the potential health impacts of the project, increased dust levels at nearby residences and cumulative air quality impacts from mining in the Hunter Valley.

5.5.2 Proposal

To assess the air quality impacts of the proposal, an air quality impact assessment has been undertaken and submitted with the EIS³³. The Commission notes that the assessment has generally been undertaken in accordance with the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* as advised by the EPA.

The modelling assesses likely total suspended particulates (TSP), fine particular matter (PM₁₀) and deposited dust impacts over three representative mining scenarios (Years 3, 9 and 14). In addition it addresses cumulative impacts associated with the project and other nearby mining operations. In response to potential health concerns the modelling also includes an assessment of fine particle matter (PM_{2.5}) under the three mining scenarios. Modelling post Year 14 was not included in the modelling as it is understood that the mining footprint post Year 14 would not extend any further west, rather mining would go deeper, which would result in plant being shielded from assessment locations.

In terms of background air quality levels, the existing Mount Thorley operation includes an extensive air quality monitoring network of high volume air samplers, tapered element oscillating

³³ Todoroski Air Sciences, *Air Quality and Greenhouse Gas Assessment Mount Thorley Operations 2014*, Sydney, 2014

microbalances and dust deposition gauges around the mine. This network was used to identify existing background levels which notably are generally consistent with the EPA's regional air quality modelling.

The air quality assessment also includes an assessment of meteorological conditions in the area and identifies that predominant winds are from the south, southeast and northwest, meaning that the majority of dust impacts as a result of the proposal are likely to occur in the southeast-north west quadrants (i.e. parallel to the Bulga, Mt Thorley and Warkworth mines).

The project includes several dust generating activities including receipt of overburden from the Warkworth mine. Under the EPA's regional Dust Stop Program, MTO is currently implementing a number of pollution reduction programs under its Environmental Protection Licence including:

- Minimising dust on haul roads
- Minimising dust generated by materials handling on site
- Minimising surface disturbance and stabilising inactive disturbed areas; and
- Operating a real time air quality management system on site.

The Commission notes, as advised by the Department and EPA, that these measures are generally consistent with current best practice. It is understood that the air quality modelling factors in the above measures it does not include proposed 'active' mitigation measures (such as real-time dust monitoring and meteorological forecasting to guide the day to day planning of mining operations). As noted in the Secretary's assessment report, these predictive and real-time mitigation measures are likely to result in lower short-term dust emissions in practice than those predicted in the modelling.

5.5.3 Modelling results

The air impact assessment includes air quality criteria for the various types of air pollutants as follows:

Table 8: NSW EPA Air Quality Criteria

Pollutant	Averaging Period	Impact	Criterion
TSP	Annual	Total	90µg/m ³
PM ₁₀	Annual	Total	30µg/m ³
	24 hour	Total	50µg/m ³
Deposited dust	Annual	Incremental	2g/m ² /month
		Total	4g/m ² /month
PM _{2.5}	24 hours	-	25µg/m ³
	Annual	-	8µg/m ³
Carbon monoxide (CO)	15 minute	-	100mg/m ³
Nitrogen Dioxide	1 hour	-	246µg/m ³
	Annual	-	62µg/m ³

The modelling indicates that the project will comply with the above criteria for annual average 24-hour PM₁₀, total suspended solids (TSP) and dust deposition criteria at all privately owned receivers with the exception of assessment locations 77, 102 and 264. It is also consistent with the *Mining SEPP 2007* non-discretionary development standard for cumulative air quality (30 µg/m³ of PM₁₀ annual average for private dwellings).

Locations 77 and 264 are privately owned residences located in the village of Warkworth (and Location 102 is Warkworth Hall which is non-residential (refer Figure 5). Location 77 is understood to already be eligible for acquisition under the neighbouring Wambo mine consent. The assessment indicates that Location 264 is inferred to be within the Wambo mine's acquisition zone if it had been previously assessed. The Department has recommended that the Applicant be required to acquire Location 77 as part of the recommendation of the concurrent Warkworth Continuation Project. The Commission has also recommended further clarification of acquisition rights for Location 264 as part of that application. The Commission notes that the locations are closer to the Warkworth mine than Mount Thorley and thus more affected by that proposal.

In addition to privately owned properties, a significant number of mine owned properties would also be affected by dust above the relevant criteria. NSW Health has raised concerns regarding air quality impacts on tenants of these properties and has recommended tenants be informed of potential health risks. Further in relation to these properties the Department has recommended that the Applicant be required to undertake additional dust mitigation measures (i.e. provide air filters or air conditioning) at the request of tenants of any mine owned receivers predicted to be affected by dust impacts above EPA criteria. The Commission considers this appropriate.

In terms of short term dust impacts, the assessment identifies that background concentrations of PM₁₀ in the surrounding region are already elevated and would be expected to result in exceedances of the 24-hour impact criteria at present without any impact from the current proposal. However the modelling indicates the incremental impacts of the project would result in exceedances of the 50µg/m³ PM₁₀ criteria by up to an additional six days per year near Warkworth village, two days per year near Knodlers Lane and three days per year near the Mt Thorley Industrial Estate. No increase is predicted as a result of the project at Bulga village.

The Secretary's assessment report notes that the existing assessment does not include sufficient information to determine whether individual properties in these areas should be granted voluntary land acquisition or mitigation measures and has therefore requested that the Applicant undertake supplementary air quality modelling of cumulative 24-hour PM₁₀ to enable an assessment of this matter. The Commission has been advised by the Department that supplementary modelling has been provided which confirms that there are no additional privately owned lots that meet the criteria for acquisition in accordance with the *Voluntary Land Acquisition and Mitigation Policy*.

In relation to PM_{2.5} (fine particles) the Commission notes there are currently no adopted Australian or NSW air quality criteria for PM_{2.5} impacts and that generally PM_{2.5} is generated through combustion processes or as secondary particles formed through chemical reactions rather than through mechanical processes used on mine sites. For the purposes of the assessment the National Environment Protection Council (NEPC) provisional advisory reporting standards have been used as set out in the table above. No background data for PM_{2.5} exists for the site however using a method used by the Victorian EPA it was determined that no assessment location (that would comply with the criteria for other pollutants) would experience cumulative PM_{2.5} level above the National Environment Protection Measures (NEPM) advisory reporting standards. The EPA has confirmed that the assessment was undertaken in general accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* and that the approach adopted is consistent with other mining assessments in NSW.

In terms of other air emissions associated with the project the assessment notes that expected CO, SO₂ and NO_x emissions are likely to be minor and will comply with the EPA criteria.

In summary, the Commission notes that the air quality modelling generally indicates that the proposal will comply with relevant criteria, with the exception of annual average 24-hour PM₁₀ at three privately owned locations (77, 102 and 264) all of which are in Warkworth Village. Location 77 is recommended for acquisition under the concurrent Warkworth Continuation Project application and in its review of that application the Commission has recommended further clarification of acquisition rights for Location 264.

Accordingly, and subject to additional information and draft recommended conditions (including compliance with relevant criteria), the commission considers that the proposal will not result in air quality impacts that do not comply with relevant air quality criteria.

5.5.4 Health impacts

NSW Health (Hunter New England Population Health) in its submission raised concerns that there is no evidence of a threshold below which exposure to PM is not associated with health effects and that therefore it is important that all reasonable and feasible measures are taken to minimise human exposure to PM even where assessment criteria are met. The Commission agrees that all measures possible should be taken to minimise exposure to PM as a result of the project.

The Commission notes that in terms of human health PM₁₀ and PM_{2.5} have the potential to give rise to adverse health effects and that particles larger than 10 micrometres are essentially prevented from entering the human respiratory system due to their size. PM_{2.5} particles are of most concern in terms of health effects as they penetrate deeper into the respiratory system than larger particles and because they are generally created by combustion of fuels or by chemical reactions. Deposited dust, whilst not resulting generally in health impacts, can cause nuisance impacts.

The Commission, as advised by the EPA, understands that the proposed mitigation measures (including 'active' mitigation measures such as real-time dust monitoring and meteorological forecasting to guide the day to day planning of mining operations) incorporated into the project to minimise air quality impacts represent 'best practice measures'. Further a comprehensive Air Quality Management Plan will also be required to be prepared to inform the operation of the mine and manage potential exceedances.

Having regard to all these measures, the Commission considers that as far as practicable all possible measures will be taken to minimise exposure to PM as a result of the project.

5.5.5 Draft Recommended Conditions

The Commission has reviewed the draft recommended conditions and notes that the currently proposed condition wording provides that 'the Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria' (refer Schedule 3, Conditions 15-17). The LEC judgment was critical of this wording and concluded that there was no reason why conditions should not require compliance with the criteria. The Commission agrees with this conclusion and considers that it is appropriate that the wording of the conditions be amended to require compliance noting that extraordinary events such as bushfires, prescribed burning, dust storms etc. would be excluded (Schedule 3, Condition 17 Note (d)).

Recommendation

1. Prior to any approval Conditions 15-17 of Schedule 3 should be amended to require compliance with established criteria.

5.5.6 Summary

The Commission has given careful consideration to the impacts of the proposal on air quality. Detailed consideration has been given to issues raised in the Public Hearing and submissions.

In general the Commission is of the view that the proposal is likely to be acceptable however has recommended amendments to draft recommended conditions of consent to require compliance with the established criteria.

Recommendations

1. Prior to any approval conditions 15-17 should be amended to require compliance with established criteria.

5.6 REHABILITATION

5.6.1 Introduction

Concerns have been raised in public submissions and in the Public Hearing that the Applicant has a poor track record of mine rehabilitation in respect of the existing 1996 consent and that it is not possible to be confident that the rehabilitation proposed as part of the current application will be undertaken in a timely manner and to an acceptable standard. Concerns have also been raised that rehabilitation of post-mined land is proposed to be included in biodiversity offsets (required as part of the concurrent Warkworth Continuation Project).

5.6.2 Applicant's track record in rehabilitation

The existing 1996 mine consent for Mount Thorley (and 2003 consent for Warkworth) required that progressive mine rehabilitation be undertaken. However, the community is concerned that rehabilitation undertaken across the MTW complex to date has been poor, and that this gives them little confidence that rehabilitation proposed under the current application will be undertaken in a timely manner and to an acceptable standard.

The Commission requested additional advice on this issue from the Department, noting that in the Secretary's assessment report it was stated that 870 hectares of land had been rehabilitated across the MTW complex. In response to the Commission's request, the Department advised that

'Until recently progressive rehabilitation was hampered at the WMT mines [Mount Thorley Warkworth mine complex] by a number of legacy issues, principally that the mines were operating in a number of different pits reducing the amount of land available for progressive rehabilitation. The Department further notes that these constraints have now been removed to a large extent by the progress of mining operations and that over the last year or so, there has been a significant improvement in both the speed and the quality of progressive rehabilitation at the Warkworth mine.'

The Commission notes this advice. It is conscious that conditions of consent are recommended (refer conditions 34-36, Schedule 3) that would require rehabilitation of the site to the satisfaction of DRE, consistent with the rehabilitation strategy outlined in the EIS. In addition, the rehabilitation is to be consistent with the stated rehabilitation objectives, provide for progressive rehabilitation and be the subject of a detailed rehabilitation management plan. Condition 36 specifies that rehabilitation management plan must:

- (a) be submitted to the DRE for approval prior to carrying out any development under this consent;*
- (b) be prepared in consultation with the Department, NOW, OEH, Council and the Consultative Consultative Committee;*
- (c) be prepared in accordance with any relevant DRE guideline;*
- (d) describe how the rehabilitation of the site would be integrated with the implementation the biodiversity offset strategy;*
- (e) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);*
- (f) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform, and final land use;*
- (g) include interim rehabilitation where necessary to minimise the area exposed for dust generation;*

The Commission considers that the above requirements for the Rehabilitation Management Plan are appropriate but should also include timeframes for achieving specified rehabilitation benchmarks, with penalties to be enforced if these benchmarks are not met.

Otherwise the Commission considers that, having regard to the draft recommended conditions (as amended), the progressive rehabilitation of the site should be undertaken in a timely manner and to the required standard as overseen by DRE.

Recommendation:

1. Recommended Condition (Schedule 36) should be amended to include timeframes for achieving specified rehabilitation benchmarks with penalties to be enforced if these benchmarks are not met.

5.6.3 Offsetting of rehabilitation mine land

The biodiversity strategy proposed as part of the concurrent Warkworth Continuation Project, as certified by OEH, includes substantial reliance on rehabilitation of post-mined land (including rehabilitated land within the Mount Thorley site) to retire biodiversity credits required as a result of vegetation clearing. Concerns have been raised that this is not appropriate, that mine rehabilitation should be a requirement of development and that rehabilitated land is not appropriate for biodiversity offsetting.

The Commission notes that the *NSW Biodiversity Offsets Policy for Major Projects* (2014) now provides for the use of mine rehabilitation for offsets. This is a significant shift in biodiversity policy of which members of the public may not be fully aware. It is understood, as advised by the Department and OEH, that this recent policy position is intended to create an incentive for good quality rehabilitation (credits are generated for rehabilitation substantially superior than standard rehabilitation) and also because mine rehabilitation has the potential to make a significant

contribution to biodiversity conservation values over the medium to long term. However, it is noted that due to the risks associated with rehabilitating land, a 50 per cent discount is applied to biodiversity credits generated.

Given that mine rehabilitation for biodiversity offsetting is now explicitly provided for in government policy, the Commission accepts that the proposed approach is valid. However, it remains concerned over the timing of the offsetting of such land. In this regard, the Commission notes that the Department has recommended a condition of consent requiring that offsets associated with mine rehabilitation are to be retired within 10 years of completion of mining operations (refer Warkworth Continuation Project draft recommended condition 29, Schedule 3). If the required credits cannot be retired in that time through mine rehabilitation, the condition provides that they must be retired through another means i.e. bio banking, payment to an offset fund or providing supplementary measures. The Commission agrees that within the framework of the Biodiversity Offset Policy, this is acceptable.

5.6.4 Summary

In relation to rehabilitation the Commission is satisfied that, subject to draft recommended conditions, rehabilitation of the site will be undertaken in a timely manner and to an acceptable standard.

In respect of the proposed biodiversity offsetting of post mined rehabilitated land, the Commission accepts that this is consistent with existing government policy and that adequate safeguards are proposed to ensure only land rehabilitated to an acceptable standard is used for offsetting and that if rehabilitated land does not meet this standard, other means will be used to retire the required credits.

Recommendation:

1. Recommended Condition 36 (Schedule 3) should be amended to include timeframes for achieving specified rehabilitation benchmarks with penalties to be enforced if these benchmarks are not met.

5.7 OTHER ISSUES

5.7.1 Traffic and Transport

Chapter 19 of the Mount Thorley Operations 2014 EIS provides a summary of the traffic and transport study prepared by EMGA Mitchell McLennan in June 2014. According to the EIS, the proposed expansion of the Mt Thorley mine will not change the existing employee traffic volume and the truck traffic would largely remain at current levels. As there is no projected increase in annual train movements, the proposed expansion is not expected to cause any rail transport impacts as all coal would continue to be railed via the existing Mt Thorley Coal Loader. Therefore, no proposed specific road or rail management and monitoring measures are warranted.³⁴

The key issues raised in the Singleton Council and public submissions included:

- the closure of Wallaby Scrub Road

³⁴ EMGA Mitchell McLennan (EMM)(1), op. cit., p.259

- the increase in Rural Fire Service (RFS) response time via the new emergency vehicle access/fire trail due to the closure of the Wallaby Scrub Road
- the redirection of traffic due to the closure of Wallaby Scrub Road will result in additional traffic on the Putty Road and Golden Highway intersection.

Council in its submission advised that the RFS has indicated its acceptance of the proposed emergency access road, provided it is constructed in accordance with the its access standards.

The proposed closure of Wallaby Scrub Road would result in minor traffic impacts on the wider road network. As part of the Warkworth Continuation 2014 proposal, a Road Closure Implementation Plan for Wallaby Scrub Road is a key mitigation measure to minimise the potential traffic and road safety impacts of the closure.³⁵

The Secretary's assessment report found traffic impacts would remain unchanged. The project relies mostly on the State road network, and would therefore generate little demand for local road maintenance. Mt Thorley Operations is in discussion with Singleton Council about a potential VPA to cover the payment of local road maintenance contributions.³⁶ The Department recommends that the Applicant finalise the VPA with Singleton Council.

The Commission finds the Secretary's assessment report adequately addressed the issues raised and the recommendation is reasonable.

5.7.2 Aboriginal Archaeology

The existing MTO is managed in accordance with an approved Aboriginal Heritage Management Plan with Aboriginal cultural heritage matters managed in accordance with the plan and in consultation with the Aboriginal community. The current project would not increase the approved disturbance area however it is proposed that a long term conservation area around Loders Creek be established as part of the project. This conservation area is understood to be supported by the Aboriginal community and is shown on Figure 5 below. The Department has recommended a draft condition of consent in this regard as follows:

Loders Creek Aboriginal Cultural Heritage Conservation Area

27. Within 3 years of the commencement of development under this consent, unless the Secretary agrees otherwise, the Applicant shall enter into a conservation agreement or agreements pursuant to section 69B of the National Parks and Wildlife Act 1974 relating to the Loders Creek Aboriginal Cultural Heritage Conservation Area, recording the obligations assumed by the Applicant under the conditions of this consent in relation to the conservation area, and register the agreement/s pursuant to section 69F of the National Parks and Wildlife Act 1974.

Note: The location of the conservation area is shown in the figure in Appendix 4.

³⁵ Page 148, Mt Thorley Operations 2014 Response to Submissions, November 2014

³⁶ Page 31, Secretary's assessment report dated November 2014

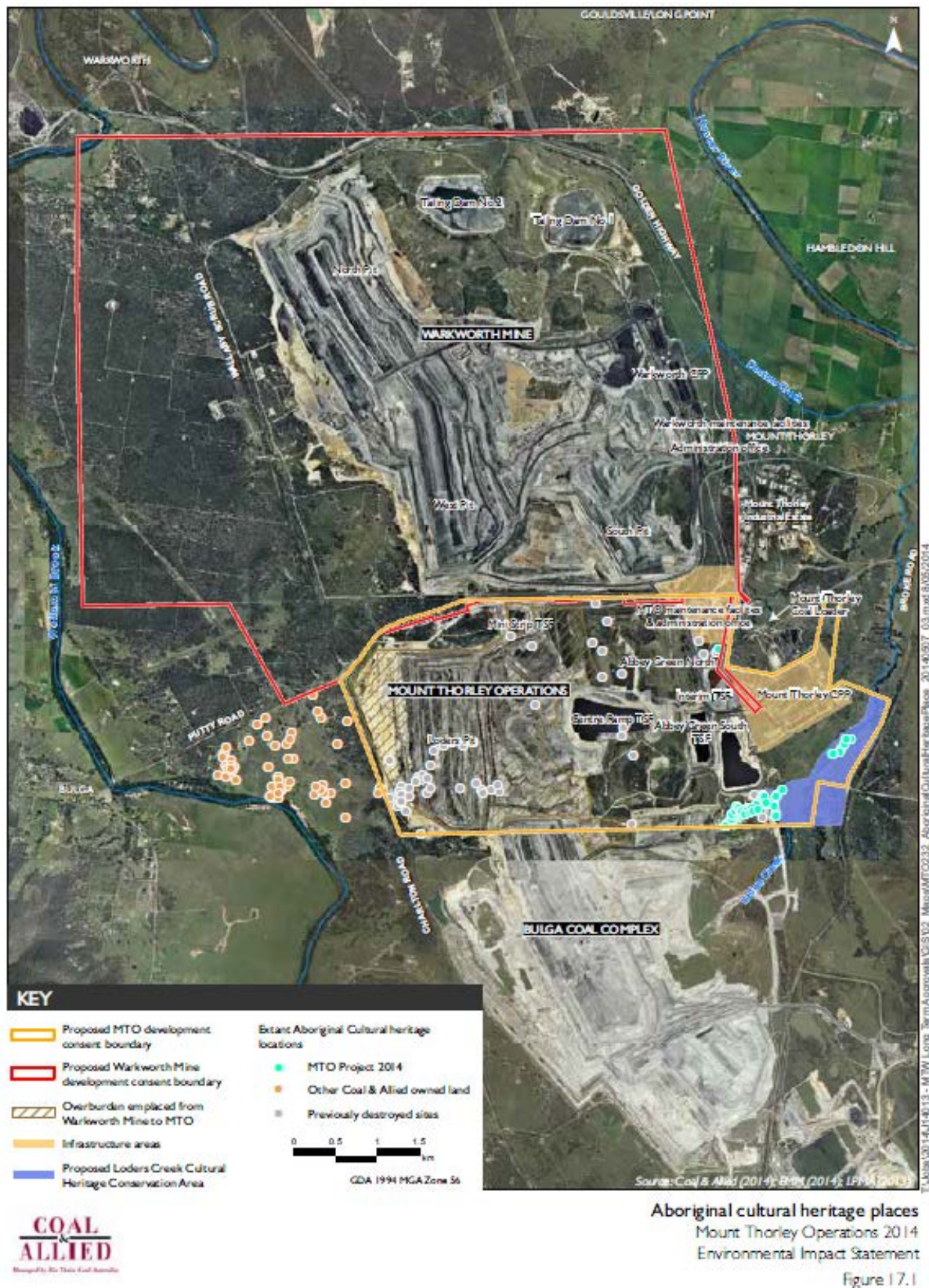


Figure 5: Aboriginal heritage sites

(Source: Mount Thorley Operations 2014 – EIS, EMM EMGA, p.237)

The Commission supports the establishment of the Loders Creek Aboriginal Cultural Heritage Conservation Area (ACHCA), but notes that part of the proposed area is outside of the site boundary and that the majority of the identified extant Aboriginal cultural heritage locations do not appear to be located within the proposed ACHCA area (refer Figure 5).

The Mount Thorley Operation EIS indicates that the proposed ACHCA covers an area of approximately 87 hectares of which 70.6 hectares lies within the site. It notes that the Applicant has consulted with Bulga Surface Operations regarding the proposed conservation area but does not given any indication of Bulga Surface Operations position on the establishment of the ACHCA. Further, the EIS notes that a reassessment of the area is being undertaken to refresh the currency and comprehensiveness of the area.

The Commission recommends that prior to the determination of the application, further information be provided that details the Aboriginal cultural heritage values of the proposed ACHCA area, ensures that significant extant Aboriginal Cultural heritage locations on site are included in the ACHCA (and therefore protected) and provides a mechanism for establishment and conservation of the ACHCA including land not currently within the subject site.

Recommendation:

1. Prior to the determination of application further information is to be provided that details the Aboriginal cultural heritage values of the proposed Loders Creek Aboriginal Cultural Heritage Conservation area, ensures that significant extant Aboriginal Cultural heritage locations on site are included in the ACHCA (and therefore protected) and provides a mechanism for establishment and conservation of the ACHCA including land not currently within the subject site.

5.7.3 Water Resources

The project includes minor upgrading of existing water management infrastructure including:

- Upgrading and increasing the rate of the approved Hunter River Salinity Trading Scheme discharge point at Loders Creek from 100ML/day to 300ML/day
- The ability to transfer and accept mine water from reliable sourcing operations including but not limited to neighbouring mine operations such as Hunter Valley Operations, Wambo Mine and Bulga Coal Complex; and
- Increasing the southern out-of-pit dam storage capacity from 1.6GL to 2.2GL within the same footprint.

The Commission notes that it is proposed that the project would be managed in accordance with MTW's Water Management Plan, prepared in consultation with the NOW and the EPA for the integrated MTW operations. The plan requires:

- Diversion of clean water runoff around areas of mining disturbance
- Collection and treatment of sediment-laden runoff from disturbed areas of discharge
- Collection of groundwater inflow and runoff from active mining areas within the MTW water management system
- Collection and treatment [storage] of potentially contaminated mine water prior to discharge to the MTW water management system

- Minimisation of water supply requirements from external sources by utilising onsite water for dust suppression and coal processing
- Discharging excess mine water from the site based on existing entitlements under the Hunter River Salinity Trading Scheme.³⁷

In respect of the potential impact of the proposal on surface and groundwater resources in the locality, the Commission notes that the NSW Office of Water has advised that it is satisfied that the project would not have any significant impacts over and above the impacts associated with the existing approved project. The Department has recommended a broad suite of conditions (refer conditions 20-25, Schedule 3) to ensure the ongoing management and protection of water resources in the vicinity. The Commission considers that these conditions are appropriate and represent best practice measures.

Accordingly it is considered that, subject to the imposition of recommended conditions of consent, the proposal will not give rise to adverse impact on water resources.

³⁷ EMGA Mitchell McLennan (EMM)(1), op.cit., p 33

6 CONCLUSION / RECOMMENDATIONS

The Commission has carefully considered the application for the Mount Thorley Continuation Project. The Commission has also considered the submissions made to the Commission and to the Department of Planning and Environment, the issues raised at the Public Hearing, advice from government agencies, and other documents referred to throughout this report.

The Commission notes that the Mount Thorley Continuation Project will result in economic benefits to both the State and the region. In summary these benefits include:

- Continued extraction of coal from the already approved operations to ensure an additional 29 million tonnes of coal
- Net capital expenditure with a net present value (NPV) of \$4 million
- The continuation of approximately 120 jobs for an additional 11 years
- The payment of \$50 million in royalties in NPV terms to the State.

While these benefits on their own are not significant, the Commission notes that together with the Warkworth Continuation Project the project would have significant economic benefits. These include approximately \$1,488 million in net economic benefit, provision of continued employment for up to 1,300 workers and the generation of royalties to the State in the order of \$617 million. The Commission also notes that the Warkworth Continuation Project is dependent on approval of the subject Mount Thorley Continuation Project.

The Commission has given careful consideration to the key issues raised in relation to the application including economic, social, noise, visual, air quality, rehabilitation, traffic and transport, Aboriginal archaeology and water impacts.

In conclusion, the Commission has made a number of significant recommendations and requires further information on a variety of matters prior to determination of the subject application. The Commission notes that whilst the current application is very similar to the Mount Thorley part of the previous Warkworth Extension Project (that was refused by the LEC) significant legislative and policy changes have occurred since that time. The Commission is required to consider the current legislative and policy environment in its review of the application. Further, changes have been made to the application to address issues raised in the LEC decision.

The Commission recognises that the project (in conjunction with Warkworth Continuation Project) provides for mining of a significant resource and will have very significant direct and indirect economic and social benefits for the State and the Hunter region. It further notes that if the projects were not approved, there would be substantial adverse economic impacts especially to the towns of Singleton and Cessnock. These impacts include the loss of significant royalties to the NSW government, a reduction in infrastructure projects to the Hunter region and lower wage and salary income for both current employees and contractors.

In terms of environmental impacts, the Commission has concluded that the impacts of the project are acceptable subject to additional information as detailed herein and the imposition of stringent conditions of approval.

In summary the Commission considers that the project is consistent with government policy and legislation and is capable of being approved.

Recommendations

Economic Impacts

1. The Applicant's economic assessment, including the CBA, should be updated to reflect the current economic climate.
2. As part of the determination of the project, DAE should review the additional information and any updated economic assessment/CBA provided by the Applicant and provide updated advice to the Department as required.
3. The following options should be considered for the future of Bulga village:
 - d. Compensating property owners who wish to sell. This compensation would be paid by the Applicant and the compensation amount would be the difference between movements in the average regional/sub-regional property price and that of local property sale prices based on an independent valuation process. A dispute resolution process would also need to be agreed
 - e. Relocating the village at the expense of the NSW government and Applicant. The government would be required to deliver all new infrastructure, while the applicant would be required to pay for the construction of new houses. Any relocation decision and associated planning would need to involve the residents of Bulga
 - f. Requiring the Applicant to develop a Village Enhancement Strategy in consultation with the local community and Council and to fund and implement a program of works or similar via a VPA with the Minister and Council.

Noise

4. The potential noise impacts associated with the upgrading of the CPP should be addressed prior to the determination of the application
5. The acceptability of setting noise limits above the PSNL should be considered by the NSW government, ideally via the review of the INP
6. To ensure the benefits of the attenuation program will be fully realised, regular monitoring and audit of the performance of the attenuated fleet and equipment should be carried out
7. A public information briefing session should be held to clarify the operation of the Trigger Action Response Plan
8. The Applicant should update its Statement of Commitments to provide acquisition and mitigation rights to those properties which were granted such rights under the now repealed approval. The terms of these rights should be similar to those that would be granted under the approval conditions should the application be approved
9. The recommended public information briefing session referred to in Recommendation 3 should include a briefing on the application of the LFN modification factor and the purposes of different types of monitoring as well as the operation of the Trigger Action Response Plan
10. The concerns raised in the SKM report that insufficient data was collected to enable it to assess the accuracy of ongoing routine noise monitoring carried out by the Applicant should be addressed before determination of the current application
11. The conditions in any approval should require the application of an appropriate noise modification factor for LFN during compliance testing if LFN is prevalent before comparison with the PSNL in the approval. However, if a new INP is adopted before the determination of this application, the new INP methodology and criteria should apply
12. Up-to-date information should be provided on both the Rio Tinto website and hotline with respect to blasting schedule and feedback/complaint management.

Air Quality

13. Prior to any approval conditions 15-17 should be amended to require compliance with established criteria.

Rehabilitation

14. Recommended Condition 36 (Schedule 3) should be amended to include timeframes for achieving specified rehabilitation benchmarks with penalties to be enforced if these benchmarks are not met.

Aboriginal Archaeology

15. Prior to the determination of application further information is to be provided that details the Aboriginal cultural heritage values of the proposed Loders Creek Aboriginal Cultural Heritage Conservation area, ensures that significant extant Aboriginal Cultural heritage locations on site are included in the ACHCA (and therefore protected) and provides a mechanism for establishment and conservation of the ACHCA including land not currently within the subject site.

SELECTED REFERENCES

BAEconomics	<i>Economic Impact Assessment for Warkworth Continuation 2014 and Mount Thorley Operations 2014</i> , Canberra, 2014
Day Design Pty Ltd	<i>Response to Noise and Vibration Issues</i> , 2014
Deloitte Access Economics	<i>Peer review of economic assessment of Mount Thorley Warkworth extension</i> , November 2014 (Commercial-in-Confidence)
EMGA Mitchell McLennan (EMM)(1)	<i>Mount Thorley Continuation 2014 Environmental Impact Statement</i> , Volumes 1 and 2, Sydney, June 2014
EMGA Mitchell McLennan (EMM)(2)	<i>Warkworth Continuation Project 2014 Response to Submissions</i> , Sydney, November 2014
EMGA Mitchell McLennan (EMM)(3)	<i>Mount Thorley Operations 2014 Response to Submissions</i> , Sydney, November 2014
EMGA Mitchell McLennan (EMM)(4)	<i>Warkworth Continuation Project 2014 Environmental Impact Statement</i> , Sydney, June 2014
Integrated Design Solutions	<i>Mount Thorley Continuation 2014 Visual Impact Assessment</i> , Sydney, 2014
NSW Environment Protection Authority	<i>NSW Industrial Noise Policy</i> , Sydney, 2000
NSW Government	<i>Voluntary Land Acquisition and Mitigation Policy – SSD Mining</i> , December 2014
NSW Planning and Environment	<i>State Significant Development Assessment Mount Thorley Continuation Project (SSD-6464) – Secretary’s Environmental Assessment Report</i> , Sydney, November 2014
Sinclair Knight Merz	<i>Mount Thorley/Warkworth Coal Mine Independent Noise Monitoring Report</i> , 30 April 2012
Todoroski Air Sciences	<i>Air Quality and Greenhouse Gas Assessment Mount Thorley Continuation 2014</i> , Sydney, 2014

LIST OF APPENDICES

- 1. Minister's Terms of Reference**
- 2. List of speakers at the Public Hearing**
- 3. Summary of Meetings**
 - a. 5 December 2014 – Briefing from the Department of Planning and Environment, the Office of Environment and Heritage, the Department of Resources and Energy, the Environmental Protection Authority and the Office of Water
 - b. 9 December 2014 – Briefing to the applicant and site inspection
 - c. 9 December 2014 – Meeting with Singleton Council
 - d. 5 February 2015 – Meeting with the Department of Planning and Environment and noise consultant Dr Norm Broner
 - e. 11 February 2015 – teleconference with Office of Environment and Heritage
- 4. Additional information from the Proponent**
 - a. 10 December 2014 – Cost Benefit Analysis
 - b. 15 December 2014 – Options for refinements to the final landform and void; and predictions for project-alone 24 hours PM₁₀ concentrations for vacant land.
 - c. 16 December 2014 – Biodiversity offset strategy.
 - d. 9 January 2015 – Additional information requested following briefing and site inspection.
- 5. Additional information from the Department of Planning and Environment**
 - a. 17 December 2014
 - b. 18 February 2015
- 6. Additional information from the Environmental Protection Authority - 20 February 2015**
- 7. Additional advice from Dr Norm Broner (noise consultant) - 22 February 2015**

Appendix 1

Minister's Terms of Reference

Request to the Planning Assessment Commission Mt Thorley Continuation Project

**Section 23D of the *Environmental Planning and Assessment Act 1979*
Clauses 268R and 268V of the *Environmental Planning and Assessment Regulation 2000***

I, the Minister for Planning, request the Planning Assessment Commission to:

1. Carry out a review of the Mt Thorley Continuation Project, and:
 - a) consider the EIS for the project, the issues raised in submissions, the formal response to submissions, the Department of Planning and Environment's preliminary assessment report of the project, and any other relevant information provided on the project during the course of the review;
 - b) assess the merits of the project as a whole, paying particular attention to the potential amenity, health and social impacts on the village of Bulga and surrounds;
 - c) apply all relevant NSW Government policies in those considerations and to that assessment; and
 - d) provide recommendations on any reasonable and feasible measures that could be implemented to further avoid, reduce and/or offset the potential impacts of the project.
2. Conduct public hearings on the project no later than 12 December 2014.
3. Complete the review by 20 February 2015, unless the Secretary agrees otherwise.



**The Hon. Pru Goward MP
Minister for Planning**

Sydney

6 November 2014

Appendix 2

List of speakers at the Public Hearing

Planning Assessment Commission Hearing

Warkworth and Mt Thorley Continuation Projects, Singleton

Commencing 8.30am, Thursday 18 December 2014 and continuing at 8.00am, Friday 19 December 2014

Singleton Heights Diggers Club (Alroy Park Complex) Dorsman Drive, Singleton Heights

Hearing Schedule Thursday 18 December 2014

8.30 am	Opening Statement from the Chair – Paul Forward
Registered Speakers:	1. Proponent Chris Salisbury
	Speakers for Warkworth
	2. John Kaye
	3. Danielle Hanson
	4. Mike Campbell OAM
	Speakers for Warkworth and Mt Thorley
	5. Singleton Council Mark Ihlein
	6. Nature Conservation Council Kate Smolski
	7. Lee Watts
	8. Patrick Cassegrain
	9. Singleton Business Chamber Ryan Fitzpatrick
	10. Hunter Environment Lobby Inc Jan Davis
	11. Stephen Williamson
	12. Soo Cheol Shin
	13. Land Water Future Holly Creenaune
	14. Lock the Gate Alliance Steve Phillips & Georgina Woods
Morning tea at approximately 10.45am (15 minutes)	<i>Continues over page</i>

Please note

Speakers are allocated a maximum of 5 minutes per project for an individual, or 15 minutes for groups. Where a speaker has registered to present on both the Warkworth and Mount Thorley projects, speaking time will be a maximum of 10 minutes for an individual, or 30 minutes for groups. The hearing is open to the public, and as such not all parties present will speak.

The Commission has copies of all written submissions made to the Department of Planning and Environment (DP&E) on the proposal in response to its exhibition, so it is not necessary to restate those views. The purpose of this hearing is to hear views on the proposal including on the Department of Planning and Environment's preliminary assessment report. These views will be considered by the Commission in preparing its Review Report.

No audio recording is permitted. The assessment report and recommended conditions are available on the PAC website at www.pac.nsw.gov.au. If you have registered to speak but your name is not on the list, or if you have any other questions, please contact Rebeca Chungue on 9383 2112 or (pac@pac.nsw.gov.au).

Hearing Schedule Thursday 18 December 2014 continued

Lunch break at
approximately 1.00pm
(45 min)

15. Environmental Defenders Office
Represent the Bulga Milbrodale Progress Association and
Bill Lawson, Helen Upward, Phillip Reid, Greg Banks,
Pauline Rayner, Ron Corino, Michael Rayner, John
Thompson, Delwyn Thompson, Pam Kolatchew, Peter
Kolatchew, Rex Davis, Nichola Krey, Denise Lamb, Sarah
Roberts, Garth O'Brien, Andrew O'Brien, Graeme R
Gibson, Nicole Highett, Neil Mitchell, Naomi Cupitt, Jade
Cupitt, Tracey Harris and Ashleigh Harris.

16. Paul Harris

17. Paddy O'Sullivan

18. Doctors for the Environment Australia
Ben Ewald

19. Graeme O'Brien

20. Susanna O'Brien

21. Peter Lockwood

~~22. Judith Leslie~~

~~23. Alan Leslie~~

24. Shane Davy

25. Greg Carson

26. Geoffrey Stevenson

27. Joe Clayton

28. Heather Davis

29. Tim Berryman

30. John Lamb

31. Ryan Fox

32. Hubert Upward

Continues over page

Afternoon tea at
approximately 3.30pm
(15 minutes)

Please note

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Hearing Schedule Thursday 18 December 2014 continued

Dinner at approximately
6.30 pm (30 mins)

- | |
|--|
| 33. Hunter Community Environment Centre
John McKenzie |
| 34. Hunter Bird Observers Club
Ann Lindsey |
| 35. Gregory Paul Crowe |
| 36. Ray Bellamy |
| 37. Max Hughes |
| 38. Regan Ferguson |
| 39. Graham McLaughlin |
| 40. Chris Timbury |
| 41. Dennis Maizey |
| 42. Nigel Banks |
| 43. Chris Burton |
| 44. CFMEU
Peter Jordan |
| 45. Ron Fenwick |
| 46. Clare Hurney |
| 47. Kristy Hedley |
| 48. Melissa Upward |
| 49. Darren Gardiner |
| 50. NSW Indigenous Chamber of Commerce
Deb Barwick |
| 51. Simon Merrick |
| 52. William Young |
| 53. Leeola McLaughlin |
| 54. Running Stream Water Users Association
Jolieske Lips |

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Hearing Schedule Thursday 18 December 2014 continued55. ~~Jamie Taylor~~56. ~~Stirling Keayes~~57. ~~Tanya Tlaskal~~

58. George Tlaskal

59. Hunter Communities Network
Bev Smiles***Hearing will recommence at 8.00am, Friday 19 December 2014***Please note

Speakers are allocated a maximum of 5 minutes per project for an individual, or 15 minutes for groups. Where a speaker has registered to present on both the Warkworth and Mount Thorley projects, speaking time will be a maximum of 10 minutes for an individual, or 30 minutes for groups. The hearing is open to the public, and as such not all parties present will speak.

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Planning Assessment Commission Hearing

Warkworth and Mt Thorley Continuation Projects, Singleton

Recommencing 8.00am, Friday 19 December 2014

Singleton Heights Diggers Club (Alroy Park Complex) Dorsman Drive, Singleton Heights

Hearing Schedule Friday 19 December 2014

8.00 am	Opening Statement from the Chair – Paul Forward
Registered Speakers:	Speakers for Warkworth
	60. Wonnarua Group (WTC) Kevin Taggart, Uncle Bill Smith, Warren Taggart & Steve
	Speakers for Warkworth and Mt Thorley
	61. NSW Indigenous Chamber of Commerce Deb Barwick
	62. Geoff Brown
	63. Barb Brown
	64. Elizabeth Burton
	65. Ian Hedley
	66. Wendy Lawson
	67. Anne Maree McLaughlin
	68. Thomas Ferguson
	69. Penny Hughes
	70. John Krey
	71. Leslie Krey
	72. Robert McLaughlin
	73. Amie Carter
	74. Hunter Business Chamber Kristen Keegan
	75. Damon Hooker
	<i>Continues over page</i>

Morning tea at
approximately 10.30
(15 minutes)

Please note

Speakers are allocated a maximum of 5 minutes per project for an individual, or 15 minutes for groups. Where a speaker has registered to present on both the Warkworth and Mount Thorley projects, speaking time will be a maximum of 10 minutes for an individual, or 30 minutes for groups. The hearing is open to the public, and as such not all parties present will speak.

The Commission has copies of all written submissions made to the Department of Planning and Environment (DP&E) on the proposal in response to its exhibition, so it is not necessary to restate those views. The purpose of this hearing is to hear views on the proposal including on the Department of Planning and Environment's preliminary assessment report. These views will be considered by the Commission in preparing its Review Report.

No audio recording is permitted. The assessment report and recommended conditions are available on the PAC website at www.pac.nsw.gov.au. If you have registered to speak but your name is not on the list, or if you have any other questions, please contact Rebeca Chungue on 9383 2112 or (pac@pac.nsw.gov.au).

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Hearing Schedule Friday 19 December 2014 continued

Lunch may be taken at
approximately 12.00pm
(30 minutes)

76. Micheal Budynek

77. Claire Hurney

78. Stewart Mitchell

79. Daniel McLaughlin

80. Marie Mitchell

81. Wayne Diemar

82. Larry Weathered

~~83. Maria Cotter~~

84. Deidre Olofsson

Hearing concludes

Please note

Speakers are allocated a maximum of 5 minutes per project for an individual, or 15 minutes for groups. Where a speaker has registered to present on both the Warkworth and Mount Thorley projects, speaking time will be a maximum of 10 minutes for an individual, or 30 minutes for groups. The hearing is open to the public, and as such not all parties present will speak.

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Appendix 3

Summary of meetings

MEETING NOTE

Meeting note taken by Kate Wedgwood and Paula Poon	Date: Friday, 5 December 2014	Time: 2:15pm
Project: Warkworth and Mt Thorley Continuation Projects		
Meeting place: NSW Planning Assessment Commission Offices, Level 13 301 George St, Sydney		
Attendees: Commission Members: Mr Paul Forward, Mr Gordon Kirkby and Ms Lynelle Briggs AO PAC Secretariat: Kate Wedgwood and Paula Poon Department of Planning and Environment: Mike Young (Manager, Mining Projects), David Kitto (A/ED Resource Assessments) and Elle Donnelly (Planner) Office of Environment and Heritage: Monica Collins (Director, North Branch), Andrew McIntyre (Manager, Hunter and Central Coast) Department of Resources and Energy: David Blackmore (Director, Environmental Sustainability), Will Hughes (Director, Mineral Operations) EPA: Larry Clark (Manager, Noise Assessments Unit), Adam Gilligan (Manager, Hunter Region) Office of Water: Mitchell Isaacs (Manager, Strategic Stakeholder Liason)		
The purpose of the meeting is to brief the Commission on the two projects.		
The following is a summary of the issues discussed: Background - Combining mines to create huge mining complex has been a growing trend in the Upper Hunter. - Although the Mt Thorley mine and Warkworth mine have separate development consents, they have been managed as a single mining complex since 2004. - The 2010 application for the Warkworth Extension Project included further integration of the 2 mines and proposal to mine an area (to the west of the site) that was identified as an offset area in the existing approval. - The application was approved in 2012. An appeal of the determination was upheld in the LEC and Court of Appeal. - The Court judgements identified the following issues with the 2010 application: - Assessing the two mines under one application; - Biodiversity and impacts on EEC, particularly the Warkworth Sands Woodlands; - Biobanking methodology; - Adequacy of offset; - Noise impacts; - Social impacts (arising from air quality, noise and visual impacts); and - Loss of "sense of place" held by community. Difference between current applications and 2010 application - In operational terms, the current applications are similar to the 2010 application (same footprint etc). - The key difference is that the 2010 application dealt with the two mines in one application, whereas there are now two applications, one for each mine. - Policy settings have changed since 2013 including the Mining SEPP amendment 2013, the NSW Biodiversity Offsets Policy for Major Projects, and the Voluntary Acquisition and Mitigation Policy. - The current applications have addressed issues identified in the Court judgements, including background		

noise levels, low frequency noise, offsets and the cost benefit analysis.

- The offset package has been reviewed and expanded to be consistent with current policy.

Recent policy changes

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) Amendment (Resource Significance) 2013 (Mining SEPP amendment 2013)

- Mandatory requirement for consent authority to consider the significance of the resource.
- Provision for CEO of OEH to certify offset.
- Introduction of non-discretionary standards (eg noise, blasting and air) that cannot be used to refuse the application.

NSW Biodiversity Offsets for Major Projects Policy

- Recognition that it may not be possible to offset all impacts, but for economic and/or social reasons the mine may still be approvable.
- No red-flag/show stopper, issues are identified for consideration.
- Clear methodology established to determine liability and the value of an offset, making it possible to trade biodiversity credits.
- 3 ways to deal with biodiversity liability: by direct offsets; or translating liability into a monetary value to provide funding into a yet to be set up offset account; or supplementary offsets (non-land base option, eg contributing to a recovery program).
- Mine rehabilitation to be taken as an acceptable (discounted) offset.
- All offsets will be provided under a bio-banking agreement, rather than through a VPA and/or approval conditions.
- Work in progress includes responsibility of monitoring the offset, establishing a mechanism to receive offset funds, review management conditions in development consent

Voluntary Land Acquisition and Mitigation Policy

- Acquisition a last resort after all reasonable and feasible mitigation measures have been undertaken.
- The policy sets out the criteria for noise and particulate matter where voluntary mitigation and acquisition rights apply.
- The preferred approach to manage exceedances of the relevant assessment criteria is negotiated agreements between the mine and the affected landowners.

Economic considerations

- Noted the Court's view of the economic assessment of the 2010 application
- There are certain economic benefits of mining and even if the mine is not profitable, the State still gets revenue.
- Public benefit v private benefit
- Economic Guidelines are currently being developed by the Department, but have not yet been finalised.
- The Department has engaged an independent economic consultant to review economic assessment in the EIS. The independent review identified additional information required. The Department has requested the proponent to address the issues raised in the independent review.
- The two mines employ 1300 workers and support a lot of industries.

Water

- The proposed extension would progress away from the river.
- There was some uncertainty in relation to water quality with the 2010 application. The issue has now been clarified.
- There are some minor issues concerning the alluvial and water leaching. They are not major and can be clarified/resolved before determination of the applications or via conditions of approval.
- There are no outstanding concerns in relation to impacts on water.

Noise

- Noise was a major issue in the Court case.
- One of the issues is how to set background noise. Lots of work has been done and the Department has engaged independent experts to advise on the current applications, including an expert on low

frequency noise.

- Government policy provides 40dBA as acceptable noise level.
- According to the Department, to consider the 2 mines as one project as in the 2010 application provides a lower background noise level for assessment purposes and is easier for monitoring compliance.
- The background noise levels are now higher when the two mines are assessed as separate projects. As the criteria are higher, almost no one will get mitigation measures.
- Saddleback Ridge is perceived as a good noise barrier. It will provide a 1-2 dBA reduction during good weather. Under adverse weather condition, it will make no difference to the noise level at any receiver locations whether Saddleback Ridge is there or not.
- A large number of noise complaints have been received over the past year (the Department noted that its compliance team found that the mines are operating close to limits).

Resource

- The proponent's figures regarding resources provided by the mines are reasonable and accepted.
- From the State's perspective, the question is what the proposal can bring to the State. Warkworth is the 6th biggest mine and the estimated royalty for the Warkworth mine alone would be \$1.2 billion over the life of the mine.
- Mine licence issued in the 1970s. From a resource planning point of view, the mine is always seen as part of the core infrastructure of the Hunter coal field.
- The two mines are producing less than permitted under existing consents.

Aboriginal Heritage

- The Aboriginal heritage assessment in the EIS is considered of high quality and the identified level of significance of the sites are accepted.
- Next step is to set up conservation area and cultural heritage working group.

Biodiversity and EECs

- Proponent accepted the LEC's view of Warkworth Sands Woodlands (WSW).
- The 3 key issues of biodiversity are:
 - The replacement of the 2003 offset. It should be noted that the Ironbark was not listed as a EEC in 2003.
 - The liability of new clearing
 - Red-flag/special area that requires further calculation.
- The proponent has used acceptable methodology and used it correctly. The credit calculation is correct and the impact calculation is also correct.
- WSW is unique. The question is not what it is, but where it is. Restoration is not recreation of the same community. Generally speaking, rehabilitation to 70% of woodland structure in terms of species is considered doing well.
- The proposed offset in Goulburn River if secured in perpetuity, is considered to be a net improvement.
- The OEH has certified that the proposed mitigation/offset measures are adequate to compensate for the impacts of the project on biodiversity concerns.

Other comments

- The legislation allows an applicant to lodge a development application whenever it wishes to do so.
- Each application has to be assessed on its merit. The outcome of any previous application is not part of the merit assessment of a new application.
- The Department has requested additional information from the proponent including project alone 24 hour PM₁₀ concentrations for vacant land and final landform for the site, particularly a smaller final void, which will be made available to the public and PAC once received.

Documents to be provided: List and status of major policy changes that have occurred since previous the previous application and court case.

Meeting closed at 4:45pm

MEETING NOTE

Meeting note taken by Kate Wedgwood	Date: Tuesday, 9 December 2014	Time: 8.15am
Project: Warkworth and Mount Thorley Continuation Projects		
Meeting place: Mount Thorley Warkworth Administration Offices		
Attendees: Commission Members: Mr Paul Forward, Mr Gordon Kirkby and Ms Lynelle Briggs AO PAC Secretariat: Kate Wedgwood Coal and Allied representatives (including technical specialists): • Chris Salisbury, Managing Director Rio Tinto Coal Australia • Mark Rodgers, General Manager Operations, Mount Thorley Warkworth • Dave Bennett, Manager, Mine Planning • Darryl Messenger, Manager, CHPP & Maintenance • Morgan Costello, Manager Mining • Anthony Russo, Manager, Project Approvals • Nel Byatt, Principal Advisor, Land Offsets • Michael Lloyd, Specialist, Project Approvals • Nicola Proctor, Specialist, Project Approvals • Simon Ball, Minter Ellison • Brian Fisher, BAEconomics • Luke Stewart, EMM • Najah Ishac, EMM Acoustics • Aleks Todoroski Todoroski, Air Sciences		
The purpose of the meeting is to provide a brief overview of the proposed development before undertaking a site inspection of the mining complex and surrounding area.		
Background • Rio Tinto has been mining in the Hunter for more than 150 years. • High performance coal produced at Warkworth and Mount Thorley. • The current downturn in the coal market has meant over 3000 jobs have been lost in the Hunter. • The mining complex is challenged by its geology and the amount of earth to be moved is high. • Due to the geology, operating costs are high. • Delays in approvals are adding to costs. Existing operation • Operated by Rio Tinto and Coal and Allied. • The mining complex has three draglines, worth \$150 million each. • There are 40 coal seams, each approximately 250 metres deep. • All coal is transported by rail via the Mouth Thorley coal line to PWCS and NCIG terminals in Newcastle. • Approximately 1300 staff employed at the mining complex (800 in the mining team, 250-300 maintenance personnel, 150 coal handling staff and the remainder being expert staff). Proposal overview • The mine plan is driven by the location of coal. • Approval of the projects would allow the mine to continue operating at its existing level of production. • The proposal has been modified, where possible, in response to community concern and the LEC judgement. • Proposal is consistent with government policies. • If approval is not granted in 2015, the mining operation will need to be substantially scaled back. • The proposal would ensure the continued direct employment of around 1300 staff. • No residences will be unreasonably affected.		

Wallaby Scrub Road

- Land valuation will occur prior to the proposed closure of Wallaby Scrub Road.
- This will be resolved through the negotiation with Singleton Council of the Voluntary Planning Agreement, which is currently subject to negotiation.

Proposed mitigation measures

The proposed mitigations measures include:

- Offset areas;
- 1800ha national park;
- Noise suppression of mining fleet;
- Environmental/real time data, including an online database for community complaints;
- VPA for community benefits; and
- Training and development programs for local community.

The meeting was followed by a tour of the mining complex, Bulga village and surrounding area.

The tour concluded at approximately 12:30pm

MEETING NOTE

Meeting note taken by Kate Wedgwood	Date: Tuesday, 9 December 2014	Time: 1:00pm
Project: Warkworth and Mt Thorley Continuation Projects		
Meeting place: Singleton Council Administration Centre, Cnr Queen St and Civic Ave, Singleton		
Attendees: Commission Members: Mr Paul Forward, Mr Gordon Kirkby and Ms Lynelle Briggs AO PAC Secretariat: Kate Wedgwood Singleton Council: Mark Ihlein (Director – Planning and Sustainable Environment Group), Lindy Hyam (General Manager)		
The purpose of the meeting is for Singleton Council to discuss the projects and Department's assessment reports with the Commission		
<u>Changes to legislation</u> • The community feels that the parameters have changed in terms of the new assessment criteria and changes to legislation. • The amendments to the Mining SEPP mean that mines will always be approved, due to their economic benefits. The community is in a "no win" situation. <u>Wallaby Scrub Road</u> • In the past, Council has opposed the closure of Wallaby Scrub Road due to visual impacts, loss of aboriginal heritage, impacts on Bulga and loss of biodiversity. However, the new Council is aware of a recent downturn in the mining market and has concerns about the future of Singleton if this downturn continues. • Wallaby Scrub Road and Saddleback Ridge were always considered the demarcation points between mining and rural/residential areas. • 70-80% of the mine's expansion is a result of the closure of the road. • There should be a separate compensation process for the closure of the mine, based on land valuation. • The Department's assessment report fails to adequately address the impacts associated with closure of the road. <u>VPA</u> • \$11 million has been offered by the proponent, which is considered inadequate considering the size of the mine and the likely impact on the community. • Council is seeking \$50,000 per mtpa of coal. • Council's view is that half of the revenue from the VPA should go to community projects, with the other half to Council. • Council and the proponent are having ongoing discussions. <u>Other impacts</u> • No adequate consideration has been given to water quality in the future. • Cumulative air quality impacts in the Upper Hunter are a significant issue. Council's preference is for real time data to be available to the community. • Rehabilitation on the site and wider region is "barely average". <u>Other points</u> • Singleton is a mining community, however consideration needs to be given to those community members		

who are not associated with mining.

- The proponent has addressed some of the concerns raised with the 2010 application; however it is ultimately the same proposal.
- The Secretary's assessment reports contain a number of errors.
- The community would prefer an underground operation at MTW, however Council acknowledges that this would likely be economically unfeasible for Rio Tinto.

Meeting closed at approximately 2:00pm

MEETING NOTE

Meeting note taken by Kate Wedgwood	Date: Thursday, 5 February 2015	Time: 2:30pm
Project: Warkworth and Mount Thorley Continuation Projects		
Meeting place: NSW Planning Assessment Commission Offices, Level 13 301 George St, Sydney		
Attendees: Commission Members: Mr Paul Forward, Mr Gordon Kirkby and Ms Lynelle Briggs AO PAC Secretariat: Kate Wedgwood and Paula Poon Department of Planning and Environment: Oliver Holm (Executive Director, Resource Assessments and Compliance), Mike Young (Manager, Mining Projects), David Kitto (A/ED Resource Assessments), Elle Donnelly (Planner) Other: Dr Norm Broner (independent acoustic consultant).		
The purpose of the meeting was to discuss the issues raised at the public hearing.		
The following is a summary of the issues discussed: Noise • Noise was a major issue raised at the public hearing. • The Commission questioned the Applicant's position that despite the encroachment of the mine and the loss of Saddleback Ridge, noise impacts will be reduced or not increased as a result of the proposal. • Dr Broner (the Department's independent noise expert) attended the meeting. Dr Broner explained the following to the Commission: - o How noise is transferred from source to receiver in various conditions. - o The type of noise generated at the mine is not tonal, it's bland. Therefore, there overall noise level can be high without causing disturbance. - o The role of Saddleback Ridge in terms of visually shielding the mine can impact on the perceived level of noise due to attitudes, perceived levels of control and expectations. - o A 1-2dBa increase does not result in a noticeable in noise. - o Having visited the site and undertaken his own measurement, Dr Broner concludes that the data and conclusions presented in the proponent's acoustic report are correct. • The Department explained that the PSNL referred to in 2012 cannot be relied upon. A lot more investigation has been undertaken in relation to background noise levels since this time. • The Commission questioned whether there is an issue with the location of noise monitors • The Department explained that under the Industrial Noise Policy, noise compliance and monitoring can only be undertaken using attended monitoring. Real time data cannot be used for compliance or made publically available because the data cannot be interpreted properly. This is primarily due to disturbances (for example insect noise). • The Department is committed to systematic and sustained noise monitoring in the area for compliance reasons. • The Department explained that some members of the community feel that the noise criteria are too low and have an expectation of quiet. • Some residents own their own devices, which Dr Broner explained are unreliable as they are not properly collaborated. 2003 Commonwealth Approval for offset areas The Department confirmed that the existing Commonwealth approval can be applied to the current proposal.		

2003 Deed of Agreement

- The Department explained that it was always intended that the mine would extend through to Wollombi Brook.
- The 2003 Deed of Agreement allows mining through Wallaby Scrub Road, subject to approval.
- Saddleback Ridge was originally proposed to be retained, however economic conditions change and therefore the extent of the mine has been reconsidered.

Voids

- The Department estimated that it costs around \$500 million to fill a void.
- In some cases the holes cannot be refilled due to the amount of dirt removed.
- The Commission questioned whether the void will be a constraint for future land use plans. The Department explained that the void is designed to be a 'sink' in perpetuity.

Visual impacts

- The Department explained that there is no acquisition criteria for visual impacts

Documents to be provided: The Commission requested additional information from the Department, including the following:

- Reasons for not using the same period/duration for the Rating Background Level calculation at different monitoring locations.
- Details on the Department's noise compliance monitoring in the region.
- Further detail on the attenuation effect of Saddleback Ridge.
- The Department's view on the Applicant's commitment to honour the voluntary acquisition rights granted to some residents under the now rescinded approval for the 2010 proposal.
- Confirmation that new EPBC approval is not required.
- Further details on rehabilitation, the final void and the proposed biodiversity offsets.
- The Department's view on the cumulative air quality impacts in the region.

Meeting closed at 3:30pm

MEETING NOTE

Meeting note taken by Helena Miller	Date: Wednesday, 11 February 2015
Project: Warkworth and Mt Thorley Continuation Projects	
Meeting place: Teleconference	
Attendees: PAC Secretariat: Helena Miller Office of Environment and Heritage: Robert Gibson and Ziggy Anderson	
The purpose of the meeting was to discuss the biodiversity impacts of the proposed WMT mine expansion, the proposed biodiversity offsetting strategy and relevant recommended conditions of consent	
The following is a summary of the issues discussed: • Ecosystem credit calculations including inconsistency between EIS and OEH Decision Report. • Species credit requirements and how proposed to be satisfied. Difficulty in understanding what is proposed. • Consistency with NSW Biodiversity Offsets Policy for Major Projects • Warkworth Sand Woodlands Rehabilitation viability including 2003 requirement for pilot project which has only recently been commenced. Significant time delay before will know if viable. Adequacy of \$1million bond. • Limitations in genetic diversity of rehabilitated communities. • Appropriateness of inclusion of post mine rehabilitation in offset credits – involves revegetation and management significantly higher than normal mine rehabilitation. • Timing of offset credit requirements – particularly relating to post mine rehabilitation credits. • Legal limitation of bio-banking on existing offset sites – OEH to write to PAC in this regard. • Implications of LEC decision. • DRE role to ensure compliance with Biodiversity Management Plan not OEH. • Appropriateness of recommended conditions of consent.	
Documents to be provided: The OEH is preparing a letter to the Commission regarding bio-banking on existing offset sites	

Appendix 4

Additional information from the applicant

Rio Tinto Coal Australia Pty Limited
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10 December 2014

Mr Mike Young
Manager Mining Projects
Department of Planning & Environment
GPO Box 39 Sydney NSW 2001

Dear Mr Young

Warkworth Continuation Project (SSD 6464)
Mt Thorley Continuation Project (SSD 6465)

Thank you for your letter dated 21 November 2014 regarding an additional information request for the above projects (referred to herein as MTW proposals). This letter responds to the request for additional project level cost and benefit information identified by Deloitte Access Economics (DAE) in its peer review of the economic assessment in the EIS.

Rio Tinto Coal Australia welcomes the conclusions of the peer review by DAE that the economic impact assessment conducted by BAEconomics is "broadly sound" and "addresses most of the Secretary's Environmental Assessment requirements". We also note that, while additional information has been requested, the Department recognises in the Assessment Report that "the matters raised by Deloitte would not materially change the broad conclusion that the project would result in a significant net positive benefit for NSW".

We understand that the main purpose of the request for more specific information is to provide a greater breakdown of the underlying project level information and assumptions in the economics assessment. The information requested by DAE is based on an example, non-mandatory table in a guideline. Our view is the Secretary's Environment Assessment requirements in respect of economic assessment have been fully met and that the assessment is robust and generally accords with relevant guidelines and industry practice.

Notwithstanding this, we have sought to respond to the information request in two ways:

1. **Provision of information:** we have provided as much of the requested further detail of information as possible in Tables 1 and 2. However, Rio Tinto is a publicly listed company and as such, has certain legal and commercial responsibilities which mean that information that is commercial-in-confidence cannot be provided. This largely relates to costs which are commercially sensitive, particularly in the difficult economic and highly competitive environment we currently face. We also note that the level of detail and type of information requested in Tables 3.1 and 3.2 of DAE's assessment has never been required before by the Department or been provided by an applicant for development consent for a coal mine in NSW (or, for example, where similar information has been provided, it has only been provided in respect of generic operating costs), presumably for the same reasons we have outlined above.

Mount Thorley and Warkworth Mines have been managed by Coal & Allied since 2004, resulting in a comprehensive understanding of existing economic variables and how these may alter in the future given uncertainty about future market conditions. Project costs are based on known existing costs at the operations, with an allowance for escalation.

DAE has also suggested that some data be provided on an annual basis. The reality is that for a very long term assessment such as that involving a coal mine with a close to fixed yearly production rate there will be very little yearly variability in the expected costs and revenues expressed in real terms.

Long term coal price projections by brokers or in-house economists are typically a fixed real price over the long term with no change over time. That is, the real price is a long run planning price that is used to determine the mine's viability for decision purposes. Thus there is little or no use in tabulating annual results from the Cost Benefit Analysis (CBA) in the present case. Such reporting may be relevant where, for example, there were major fluctuations in output contemplated over time but that is not the case for the MTW proposals.

2. **Benchmarking:** to provide additional evidence that the underlying project information and assumptions used for the assessment of the MTW proposals are reasonable, in Table 3 we compare the conclusions of economic assessments for similar projects. As shown in the table, the net positive benefit of \$1.5b estimated for the MTW proposals is broadly comparable to the conclusions of recent assessments for similar projects. Therefore, there is no reasonable basis for assuming that the outcomes of the economics assessment for the MTW proposals are not reasonable and accurate or that the detailed data and underlying assumptions of the assessment are not in line with those made for similar projects.

In addition, whether the project is economically viable – that is, the extent of the net private benefits - is a matter for the proponent. The financial viability of the proposal is a risk assumed by the private owners of Warkworth Mine and Mount Thorley Operations, and related assumptions concerning the expectations of the owners as to the future financial performance of the mine are commercial-in-confidence.

Mines like Warkworth and Mount Thorley Operations, which have been operating for over 30 years, are large scale businesses built on hundreds of millions of dollars of capital investment. The mines have been able to operate in both the lows and highs of the mining cycle and, therefore, Rio Tinto Coal Australia is best placed to assess questions of financial viability. The owners have already invested significant time and resources on applications to secure the future of this mine, and have done so in the belief, using long-term economic assumptions, that the mine is valuable to its owners.

It is also important to understand that there are robust mechanisms to ensure that the Government is not exposed to any liabilities in the event that the proposals became unviable during their life. These mechanisms include:

- security bond imposed as a condition of the mining lease under the Mining Act 1992 to ensure rehabilitation obligations are met;

- requirement to carry out mining operations in accordance with a mine operating plan which is updated every 7 years and which will require progressive rehabilitation. Again this a condition of a mining lease under the Mining Act 1992; and
- the imposition of offsets for the impacts of the project for its life under the draft consent conditions prior to all the impact occurring. This is further supported by security bonds for some offset requirements.

Given the above it is clear that if the project became unviable during its life, it would not result in all impacts being realised without any of the benefits.

The peer review by DAE also raised some additional queries regarding the economic assessment for MTW. For completeness, these have been addressed in Attachment 1.

In conclusion, given recent history on this and similar projects in NSW, Rio Tinto Coal Australia and BAEconomics were well aware of the level of scrutiny the economic assessment for this project would come under. For this reason, Rio Tinto Coal Australia commissioned a highly experienced economist, Dr Brian Fisher, to undertake the work and the approach taken by Dr Fisher is robust and conservative. The peer review broadly makes the same conclusion.

Should you wish to further discuss this matter, please do not hesitate to contact the undersigned.

Yours sincerely



Anthony Russo
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HSEC, Coal Australia

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Table 1: Data request for CBA

Input	Comments	2014 – 2018 (average annual)	2019 – 2023 (average annual)	2024 – 2028 (average annual)	2029 – 2035 (average annual)
Coal product names	Warkworth: the proposal involves extraction of an additional 230Mt ROM coal; approx. 75% is thermal coal and 25% is semi-soft (coking coal) (Section 3.5 Warkworth Continuation 2014 EIS).	N/A	N/A	N/A	N/A
	Mount Thorley: the proposal would enable the extraction of approximately 28.6Mt of ROM coal (Section 2.4.Mount Thorley Operations 2014 EIS).	N/A	N/A	N/A	N/A
Coal product types	Warkworth: the majority of coal is processed in a coal preparation plant (CPP). Some coal (currently assumed at approximately 4%) can be sold without washing and bypasses the CPP (Section 2.4.8 of Warkworth Continuation 2014 EIS)	N/A	N/A	N/A	N/A
	Mount Thorley: as for Warkworth	N/A	N/A	N/A	N/A
Annual price for each coal product	Warkworth / Mount Thorley: coal prices reflect long-term forecasts by independent brokers. Information was sourced from four broker commodity reports published at the time the CBA was prepared ie. January and February 2014 (Goldman Sachs, Deutsche Bank, Macquarie Bank, UBS). Section 3.4.2 of economic assessment and section 3.4.1 of rejoinder).	US\$85/tonne for thermal coal US\$105/tonne for semi-soft coking coal	US\$85/tonne for thermal coal US\$105/tonne for semi-soft coking coal	US\$85/tonne for thermal coal US\$105/tonne for semi-soft coking coal	US\$85/tonne for thermal coal US\$105/tonne for semi-soft coking coal
Production quantities for each coal product	See Table 1a				

Input	Comments	2014 – 2018 (average annual)	2019 – 2023 (average annual)	2024 – 2028 (average annual)	2029 – 2035 (average annual)
Other on-site revenue (eg. agricultural output)	There is no additional on-site revenue generated by the proposals, so this has not been included.				
Exploration costs	Exploration costs are included in operating costs.				
Capital expenditure costs (including exploration costs)	The net capital investment value of the two projects has been estimated as NPV A\$719m. The main components are: • Additional and replacement heavy mining equipment over the life of the consent • Mine and communications infrastructure, including workshop and train load out upgrades • Capital expenditure required at the coal preparation plants.				
Operating costs (excluding taxes and royalties)	Operating costs are commercial-in-confidence. They are based on known existing costs at the two operations, with an allowance for escalation.				
Residual value of capital	The residual value of capital at the end of the consent period (21 years) is \$38m (for both Warkworth and Mount Thorley combined).	N/A	N/A	N/A	N/A
Residual value of land	No value ascribed, discounted value small.	N/A	N/A	N/A	N/A
Rehabilitation and decommissioning costs	These costs are commercial-in-confidence. They are based on known rehabilitation costs at the operations, and rehabilitation plans outlined in the MTW Mining Operations Plans (required under the Mining Act 1992).	N/A	N/A	N/A	N/A
Off-site agricultural revenue impacts	The project is expected to have a minimal impact on other surrounding land uses. As a result, no value has been placed on this item.				

Input	Comments	2014 – 2018 (average annual)	2019 – 2023 (average annual)	2024 – 2028 (average annual)	2029 – 2035 (average annual)
Related public expenditure	No additional demand for public services and infrastructure has been identified as a result of the proposals. Any costs associated with construction of an emergency access road between Putty Road and the Golden Highway would be borne by Coal & Allied. Coal & Allied has committed to entering negotiations for a Voluntary Planning Agreement with Singleton Council. Coal & Allied has commenced discussions with Council, however a final quantum and structure is yet to be determined, hence does not form part of the economic analysis.				
Air pollution: particulate matter	Warkworth: Assessed in Chapter 11 of EIS and Appendix G (Table 9.7).	Number of privately-owned properties and days above incremental PM10 24 hour average 0 properties for a total of 0 days	Number of privately-owned properties and days above incremental PM10 24 hour average 3 properties (including 2 non-residential) for a total of 20 days	Number of privately-owned properties and days above incremental PM10 24 hour average 3 properties (including 2 non-residential) for a total of 13 days	* As described in Section 11.3 of EIS (p176), worst case impacts were assessed in Years 3, 9 and 14.
	Mount Thorley: Assessed in Chapter 10 of EIS and Appendix G (Table 9.5).	Number of privately-owned properties and days above incremental PM10 24 hour average 0 properties for a total of 0 days	Number of privately-owned properties and days above incremental PM10 24 hour average 0 properties for a total of 0 days	Number of privately-owned properties and days above incremental PM10 24 hour average 0 properties for a total of 0 days	* As described in Section 11.3 of EIS (p176), worst case impacts were assessed in Years 3, 9 and 14.

Input	Comments	2014 – 2018 (average annual)	2019 – 2023 (average annual)	2024 – 2028 (average annual)	2029 – 2035 (average annual)
Air pollution: carbon emissions	Warkworth: annual average emissions 1,038,394 tCO ₂ e each year (Scope 1) reported in Chapter 11 (p196) and Appendix G.	1,038,394	1,038,394	1,038,394	1,038,394
	Mount Thorley: annual average emissions 559,199 tCO ₂ e each year (Scope 1) reported in Chapter 10 (p159) and Appendix G.	559,199	559,199	559,199	559,199
Noise pollution	Warkworth: Table 10.6 of the EIS (p157) shows the noise predictions of the proposal. These results are also shown in Appendix F.	Indicative Year 3 • Marginal (1 to 2dB) = 27 properties • Moderate (3 to 5 dB) = 17 properties • Significant (greater than 5 dB) = 1 property	Indicative Year 9 • Marginal (1 to 2dB) = 73 properties • Moderate (3 to 5 dB) = 15 properties • Significant (greater than 5 dB) = 3 properties	Indicative Year 14 • Marginal (1 to 2dB) = 77 properties • Moderate (3 to 5 dB) = 12 properties • Significant (greater than 5 dB) = 4 properties	* As described in Section 11.3 of EIS (p176), worst case impacts were assessed in Years 3, 9 and 14.
	Mount Thorley: Table 10.2 of the EIS (p153) shows the noise predictions of the proposal. These results are also shown in Appendix F.	Indicative Year 3 • Marginal (1 to 2dB) = 56 properties • Moderate (3 to 5 dB) = 4 properties • Significant (greater than 5 dB) = 0	Indicative Year 3 • Marginal (1 to 2dB) = 5 properties • Moderate (3 to 5 dB) = 2 properties • Significant (greater than 5 dB) = 1	Indicative Year 14 • Marginal (1 to 2dB) = 5 properties • Moderate (3 to 5 dB) = 1 property • Significant (greater than 5 dB) = 1	* As described in Section 11.3 of EIS (p176), worst case impacts were assessed in Years 3, 9 and 14.

Input	Comments	2014 – 2018 (average annual)	2019 – 2023 (average annual)	2024 – 2028 (average annual)	2029 – 2035 (average annual)
			property	5 dB) = 0	
Quality of open space	The land is currently not used for any recreation/other activities, therefore, this item has not been included in the CBA.				
Rural amenity and culture	Warkworth: 1. Air quality (EIS p201) - Three privately-owned assessment locations (77, 102, and 264) may experience concentrations above the relevant criteria for 24-hour average and annual average PM10 and the Mining SEPP's cumulative air quality non-discretionary standard. Of these: assessment location 77 is within Wambo Mine's current acquisition zone; assessment location 102 is the Warkworth Hall, a non-residential location; and assessment location 264 is the Anglican Church in Warkworth village, also a non-residential location. 2. Noise (EIS p180) - Of the 221 assessment locations, predictions during adverse weather indicated that operational noise levels from the proposal would likely present significant exceedances (ie greater than 5dB(A)) of the PSNLs at a total of four assessment locations (34, 77, 264 and 102). Of these, one (77) has previously been identified as within a zone of acquisition of Wambo Mine; and other two (102 and 264) have been identified as non-residential (Warkworth Hall and Anglican Church, respectively).	Air = 1 Noise = 1	Air = 3 (including 2 non-residential) Noise = 3 (including 1 non-residential)	Air = 3 (including 2 non-residential) Noise = 4 (including 2 non-residential)	* As described in Section 11.3 of EIS (p176), worst case impacts were assessed in Years 3, 9 and 14.
	Mount Thorley: 1. Air quality (EIS p163-64) – Three privately-owned assessment locations (77, 102 and 264) may	Air = 3 (including 2 non-residential)	Air = 3 (including 2 non-residential)	Air = 1 Noise = 0	* As described in Section 11.3 of

Input	Comments	2014 – 2018 (average annual)	2019 – 2023 (average annual)	2024 – 2028 (average annual)	2029 – 2035 (average annual)
	experience concentrations above the criterion for annual average PM10 and the Mining SEPP's cumulative air quality non-discretionary standard. Of these: assessment location 77 is within Wambo Mine's current acquisition zone, assessment location 102 is Warkworth Hall, a non-residential location; and assessment location 264 is the Anglican Church in Warkworth village, also a non-residential location. 2. Noise (EIS p144) – Predictions during prevailing meteorological conditions indicated that, of the 221 assessment locations, operational noise levels from the proposal would result in significant noise level exceedances (ie greater than 5dB(A)) at one assessment location (149) to the east of the mine. This location is in MTO's 'acquisition on request' list contained in its current development consent (as modified in 2012).	Noise = 0	Noise = 1		EIS (p176), worst case impacts were assessed in Years 3, 9 and 14.

Notes: N/A refers to not applicable (only one-off values were requested).

* The study considers three indicative mine plan years (Year 3, 9 and 14) chosen to represent a range of potential impacts over the 21 year life of the proposal by reference to the location of the operations and the potential to generate dust in each year. It is noted that later years were not modelled as, between Year 14 and Year 21, the mining footprint would not extend any further west and would only deepen which would shield plant from assessment locations more than in any previous years.

Table 1a: Production profile of the MTW Continuation Project

	Without approvals (reference case)	With approvals
	(average annual ROM coal production)	(average annual ROM coal production) ¹
Warkworth Mine	12.3Mt for 8 years	14.9Mt for 22 years
Mount Thorley Mine	4.4Mt for 4 years	5.7Mt for 5 years

Notes: Based on Year 1 of 2014 but noting outcomes will not change if Year 1 commenced later: this is because production (and associated operating costs and revenue) for Year 1 are approximately the same under both cases, so incremental (net) difference is minimal or zero.

1. Maximum annual production from the two mines approximately 18Mtpa in any one year as outlined in EIS's.

Table 2: Mount Thorley Warkworth spend on suppliers

RTCA analyses procurement spend based on the postcode on supplier invoices as a proxy for location of spend. Breakdowns of MTW's total procurement spend for the last two years provide an indication of the location of future spend.

	2012	2013
Local*	29%	33%
Rest of NSW	37%	26%
Rest of Australia	33%	41%
International	1%	<1%
	100%	100%

Source: Rio Tinto Coal Australia Sustainable Development Report 2013

Notes: * Local defined as Upper Hunter, Singleton, Muswellbrook, Cessnock and Maitland LGAs.

Table 3: Results of the cost benefit analysis compared to other recent coal projects in NSW

Project	Author, date	Consent tonnes (ROM)	Net positive benefit (NPV) to NSW	Royalties (NPV)
Warkworth Continuation*	BAEconomics, June 2014	18mtpa (21 years)	\$1.34b	\$567m
Bengalla Continuation	Gillespie Economics, June 2013	15mtpa (24 years)	\$1.77b (Australia)	\$778m
Bulga Optimisation	Deloitte Access Economics, August 2013	12.2mtpa (21 years)	\$869m	\$565m
Watermark Coal	Gillespie Economics, October 2012	10mtpa (30 years)	\$1.32b (Australia)	\$565m
Stratford Extension	Gillespie Economics, June 2012	2.6mtpa (11 years)	\$145m (Australia)	\$84m

Notes: Other economic variables (eg. operating costs, capital costs etc) not included; the way in which data are presented is not comparable.

* Does not include Mount Thorley; approximately 90 per cent of the total direct (net) economic benefit of the proposals can be attributed to Warkworth Mine.

Attachment 1: Additional responses to comments made in the peer review by DAE

Coal prices

DAE has suggested that more details around the derivation of coal prices should be provided.

Coal price and exchange rate assumptions were provided in the Economic Impact Assessment, and further clarification was provided in the Response to Submissions. A summary follows.

BAEconomics' coal price and exchange rate assumptions reflect long-term forecasts by independent brokers. Information was sourced from four broker commodity reports published in January and February 2014 (Goldman Sachs, Deutsche Bank, Macquarie Bank, UBS). It is worth noting that despite the recent low levels of the spot price of thermal coal, the longer term expectations of thermal coal prices recently released by the four brokers mentioned above have not materially changed.

For the purpose of an economic evaluation of a mining project with a mine life of a further 21 years, it is appropriate to apply coal price and exchange rate expectations over the term of the investment, that is, long-term projections.

This distinction has also been recognised by the Bureau of Resources and Energy Economics (BREE 2014, p.12):

New South Wales has 10 coal projects at the Feasibility Stage; however, as these are mainly expansions to existing mines they are generally lower in cost than the greenfield developments in Queensland. While current market conditions are not supportive of these projects being approved, it should be noted that most of them have very long operating lives and decisions to commence will be based more on long term assessments of market conditions rather than today's prevailing market prices. [emphasis added]

It should also be noted that NSW Government budget estimates are based on a thermal coal price of US\$90 per tonne, higher than the long-term figure of US\$85 per tonne assumed by BAEconomics based on broker forecasts (NSW Government 2014-15, pp. 6-28).

The peer review recognises the importance of coal prices to the impact of the project, including on taxes and royalties. It was for this reason that a sensitivity analysis was conducted using different coal prices (US\$75/tonne and US\$95/tonne) and exchange rates. The conclusion of the sensitivity analysis was that the net benefits of the project to NSW remain substantial even if a materially lower long run thermal coal price is assumed.

Treatment of externalities

The detailed technical assessment of the nature and magnitude of any external costs appears in the MTW EIS. The approach taken by BAEconomics in the EIA is to divide negative externalities into two categories: those costs that can be internalised; and those costs that cannot be internalised but that are measurable.

To evaluate costs that can be internalised BAEconomics has relied on market-based and revealed preference techniques for valuing the external effects associated with the proposals. The unifying characteristic of both techniques is that they aim to value non-market impacts by observing actual behaviour, and are therefore considered to be a more reliable indicator of people's preferences. In a democratic society, the acceptance by government (on behalf of the people), of an environmental offset is the 'revealed' valuation of the resources needed to offset the particular external cost. That is, the government on behalf of society has accepted that the external cost is exactly compensated for.

BAEconomics has treated all external costs that can be internalised in this way. In doing so BAEconomics has been conservative in its assessment in the sense that it has not counted any flow-on benefits from environmental mitigation work in its CBA. BAEconomics has not double counted offsetting 'benefits' as suggested by DAE – it has simply assumed that the external costs have been fully offset by the agreed mitigation expenditure that will be undertaken by Rio Tinto. In other words, in the CBA the externalities that have been 'internalised' have a net zero impact in the CBA.

DAE suggest that an attempt should be made to estimate the value of all external costs, including health impacts, regardless of whether the effects (noise or dust for example) exceed threshold levels or not. This implies that the government has set the thresholds at a level that is insufficiently stringent. In a democratic society the government will use the scientific evidence available to it to set threshold levels that are acceptable to society. Given the information available at a particular time, regulators may make mistakes about threshold levels but BAEconomics can see no argument to attempt to justify theoretical costs that may or may not be imposed below threshold levels.

Demand for provision of local infrastructure and services

DAE suggested that there is no discussion on whether the continuation may result in additional demand for local infrastructure and services.

The EIS provided an overview of existing local infrastructure and services, with a summary provided in Section 21.3.1 and a further detailed overview provided in Appendix P. For example, Table 21.5 of the Warkworth EIS concluded:

There would be no increase in the use of local infrastructure and demand for health and allied services, emergency services and emergency departments under the proposal, as the intention is to retain the current level of employment.

Traffic would remain similar to current levels and safety levels would be unaffected.

The proposal would aim to maintain current average workforce levels across MTW operations, helping to stabilise population levels across the Singleton LGA. Subsequently, the contribution of MTW employees to council land rates would be maintained, helping to support the viability of current council services.

The continued MTW workforce and their families would also help maintain the use of local businesses and services, particularly shops, services, schools and child care facilities.

Voluntary Planning Agreement

DAE suggest that there is no discussion as to whether a Voluntary Planning Agreement (VPA) will be entered into with the local government.

Coal & Allied is committed to seeking to negotiate with Singleton Council to develop a mutually agreeable voluntary planning agreement (VPA) and this was clearly outlined in the EIS's, for example:

A VPA would be negotiated with Singleton Council. The VPA presents an opportunity to ensure a proportion of the funds are dedicated to maintaining and / or improving facilities and services in Bulga, other local neighbouring communities, and the Singleton LGA as a whole (Table 21.5 of the Warkworth EIS).

Coal & Allied has commenced discussions with Council, however a final quantum and structure is yet to be determined, hence does not form part of the economic analysis.

Under current legislation, mining companies seeking development approval are required to negotiate with councils over infrastructure contributions. There are three mechanisms by which a consent authority can require the payment of a financial contribution:

- S94 development contributions;
- S94 fixed levies;
- Voluntary Planning Agreement's.

In the absence of a VPA, the Singleton Development Contributions Plan 2008 (DCP) sets out the administrative framework for levying of development contributions under section 94 of the Environmental Planning and Assessment Act 1979 (EP&A Act) by identifying infrastructure and facilities requirements to meet the needs of the future population of the Singleton local government area (LGA). The DCP attributes costs towards provision of infrastructure/facilities and identifies how these costs will be apportioned. The DCP includes a Contributions Rates Schedule, which requires new coal mining development application contributions towards rural roads and Council's Community Enhancement Program (CEP). Whilst Council has a DCP which sets out contribution requirements from coal mining developments in its LGA, there is no specific contribution rate or formula that can be applied to a development proposal. Applying the broad principles of the DCP, the likely contribution of Warkworth Continuation 2014 towards community infrastructure can be estimated at approximately 0.44% of the capital investment value of the proposal.

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Dear Mr Young

Warkworth Continuation Project (SSD 6464) Mt Thorley Continuation Project (SSD 6465)

The Department of Planning and Environment (DP&E) requested additional information under cover of a letter dated 21 November 2014 including:

1. the predictions for project-alone 24-hour PM₁₀ concentrations for vacant land to allow the DP&E to determine the properties that may be entitled to acquisition in accordance with the NSW Government's Voluntary Land Acquisition and Mitigation Policy (VLAM Policy);
2. the additional project-level cost and benefit information requested by Deloitte Access Economics in its peer review of the economic assessment in the EIS; and
3. feasible options for further refinements to the final landform for the site, particularly in regard to reducing the size of the final void.

This letter provides a response to items 1 and 3. A separate response to the additional project-level cost and benefit information (item 2) was provided to DP&E on 10 December 2014.

In addition, the NSW Environment Protection Authority (EPA) has requested further clarification on aspects of the air quality assessment response to submissions. This clarification is also provided herein.

1. Project-alone 24-hour PM₁₀ concentrations for vacant land

Further assessment has been completed to determine the privately-owned vacant lots that may be entitled to acquisition in accordance with the VLAM Policy, which was introduced in November 2014.

The assessment comprised two steps:

- a) additional modelling of vacant lands, applying predictive/reactive mitigation as committed to under the proposal;
- b) town planning permissibility considerations for the development of residences on vacant lands.

The additional modelling was completed by Todoroski Air Science (TAS) who also prepared the air quality and greenhouse gas assessment in the Environmental Impact Statement (EIS) for the proposals. The methodology and results are given in the TAS letter attached as **Appendix A** and summarised below.

1.1. Additional air quality modelling

The DP&E has requested predictions for project-alone 24-hour PM₁₀ concentrations for privately-owned vacant land to determine if any of these properties are entitled to acquisition under the new VLAM Policy. The new VLMA Policy applies entitles vacant land owners acquisition rights where a proposal exceeds the stringent 24-hour PM₁₀ criteria of 50µg/m³ on greater than 25% of the property. Additional modelling was undertaken on vacant lands and applied the predictive/ reactive mitigation strategies committed to in the EIS.

Further details on predictive/ reactive dust management committed to under the proposals are provided in **Appendix A** and Sections 11.5 and 10.5 of the Warkworth Continuation 2014 EIS and Mount Thorley Operations 2014, respectively.

The outcomes of the modelling are presented in Figures 1 to 4 of **Appendix A**.

In regard to vacant land the VLAM Policy states voluntary acquisition rights should only be granted:

'If development contributes to exceedances of the acquisition criteria in Table 3 on more than 25% of any privately –owned land, and a dwelling could be built on that land under existing planning controls'.

Accordingly, the outcomes of the TAS modelling were considered in the context of the permissibility (or ability) of dwelling house to be erected on the subject lands pursuant to the *Singleton Local Environmental Plan 2013*.

1.2. Permissibility considerations

Interrogation of cadastral information and the outcomes of the TAS modelling identified privately-owned vacant lots that are predicted to have greater than 25% of the land area affected under the proposals. These lots are zoned RU1 Primary Production and IN3 General Industrial, pursuant to the *Singleton Local Environmental Plan 2013* (LEP).

Of these zones, dwelling houses are only permissible with development consent on the lots zoned RU1. Therefore vacant lands under the IN3 General Industrial zone were removed from further assessment.

Pursuant to Clause 4.2A of the LEP, development consent cannot be granted for a dwelling house on certain rural zoned land (which includes the RU1 zone) unless it meets the minimum lot size shown on the LEP lot size map. All lots that have been identified in the RU1 zone have a minimum lot size requirement of 40 ha.

Table 1 presents the privately-owned vacant lots with more than 25% of the land area affected under the Warkworth Continuation 2014 proposal and the permissibility of constructing a dwelling under existing planning controls on the land, considering zoning and minimum lot size requirements. The location of the lots is given on Figure 1 in **Appendix B**. There are no privately-owned vacant lots with more than 25% of land predicted to be affected under the Warkworth Continuation 2014 proposal. Therefore, this clause of the VLAM Policy would not apply to the proposal.

Table 1 Vacant lands dwelling permissibility – Warkworth Continuation 2014 proposal

Lot/DP	Owner	Zoning permissibility	Minimum lot size requirement
12//843432	Telstra Corporation Limited – Not permissible	RU1	0.04ha – Not permissible
1//1171764	James Neal	RU1	0.28ha – Not permissible
372//1026537	Daracon Engineering Pty Limited	IN3 – Not permissible	-
2//90052	Telstra Corporation Limited – Not permissible	RU1	0.02ha – Not permissible
6//770904	Edward John Burley and Carol Lesley Anne Burley	RU1	0.1ha – Not permissible
84//1124139	Shane Keys, Glenn Keus	RU1	24.23ha – Not permissible
3//1171764	William Singleton	RU1	0.25ha - Not permissible

Table 2 presents the privately-owned vacant lots with more than 25% of the land area affected under the Mount Thorley Operations 2014 proposal and the zoning permissibility of constructing a dwelling. The location of these lots is given on Figure 2 in **Appendix B**. There are no privately-owned vacant lots with more than 25% of land predicted to be affected under the proposal where construction of dwelling is permissible. Therefore, this clause of the VLAM Policy would not apply to the proposal.

Table 2 Vacant lands dwelling permissibility – Mount Thorley Operations 2014 proposal

Lot/DP	Owner	Zoning permissibility
6//255730	Milbrodale Holdings Pty Limited	IN3 – Not permissible
78//260203	KOMATSU Australia Properties Pty Ltd	IN3 – Not permissible
2//255730	Andrew Peter Gent	IN3 – Not permissible
1//255730	Yolena Pty Limited, Estanza Pty Limited	IN3 – Not permissible
5//255730	Advance Petroleum Pty Ltd	IN3 – Not permissible
3//255730	P & J Rogers Investment Pty Limited	IN3 – Not permissible
1//860916	Liebherr-Australia Pty Ltd	IN3 – Not permissible
84//622193	Sunlea Investment Spty Limited	IN3 – Not permissible
79//260203	KOMATSU Australia Properties Pty Ltd	IN3 – Not permissible
86//622193	John Vince Cicciarello	IN3 – Not permissible
83//260203	JDR Holdings Pty Ltd, Botsky Pty Ltd	IN3 – Not permissible
821//1080620	Brett Richards Electrical Pty Limited	IN3 – Not permissible
822//1080620	CTM Training Solutions Pty Limited	IN3 – Not permissible
10//1126226	GA Hayward MT Thorley Pty Limited	IN3 – Not permissible
4711//1134486	Expressway Spares Pty Limited	IN3 – Not permissible
4712//1134486	Expressway Spares Pty Limited	IN3 – Not permissible
372//1026537	Daracon Engineering Pty Limited	IN3 – Not permissible

1.3. Conclusion

There are no privately-owned vacant lots with more than 25% of land predicted to be affected where construction of a dwelling is permissible under existing planning controls for either proposal.

2. Feasible options for refinement of final landform

2.1. Background

The final landform under the proposals has been developed with recognition of the pre-mining landform features and would incorporate the existing rehabilitated landforms to ultimately be consistent with the surrounding landscape features of both the Warkworth Mine and Mount Thorley Operations (MTO).

The conceptual final landform at Warkworth Mine and MTO are shown in Warkworth Continuation 2014 EIS Figures 2.15 and 2.16, respectively.

The disturbance area proposed under the Warkworth Continuation 2014 is not mapped as, nor does it meet the criteria for, biophysical strategic agricultural land (BSAL) to which the *Strategic Regional Land Use Policy* (NSW Government 2012) applies.

2.2. Mine planning

A range of options and alternatives for the final landform were canvassed during the extensive mine planning process completed for the proposal.

An important outcome of the mine planning process is an improved final landform under the proposals. The approved final landform at MTO, incorporated into the 1995 EIS, consists of a narrow deep valley leading to a final void. On either side of this valley is an elevated ridge that grades into the surrounding landform. Design of this final landform was constrained by the amount of overburden available within MTO. The ability to transfer overburden from Warkworth Mine to MTO removes the need for a final void and allows for the design of a more natural looking final landform which would integrate better with the final landform of Warkworth Mine and the Bulga Coal Complex.

A final void will remain at Warkworth Mine because there is no source for filling. A detailed consideration of the options for the final void was provided in Section 23.2.3 of the EIS and further discussed below.

The final void for the combined North and West Pit void (at Warkworth Mine) would be approximately 445ha in area and up to 250m to 300m deep, as noted in Section 16.3.2 viii of the EIS. The void would develop to be a local 'sink' with groundwater, surface runoff and rainfall inflows slowly filling the void forming a water body.

The surface area of the final void is measured from its post-mining water level (minus 10m AHD). It is noted that DP&E's assessment report references a final void of 950ha. This figure is taken from a higher contour (approximately 60m AHD), well above the water level of final void, rather than the water level, which results in an area of 445ha.

The approved final voids under DA 300-9-2002-i and DA 34/95 across Mount Thorley Warkworth provides for a combined surface area of 491ha. The proposals allows for a net reduction in the final voids across MTW through filling of Lodgers Pit at MTO and a reduced final void footprint to 445ha. That is one less void with a reduction in area of

approximately 46ha, or 9%, smaller than current approvals. Further, the proposal allows for an integrated landscape and undulation that is not currently afforded under current approvals.

2.3. Final void alternatives

Section 23.2.3 of the Warkworth Continuation 2014 EIS provides further background on the design of the final landform, including the final void. A number of options were considered in relation to its form, including:

- a) backfilling the final void;
- b) reduction in final profile bench slope;
- c) reduction in highwall and endwall slopes.

An overview of these options is provided below. Additional alternatives considered in response to this information request are provided in item d) below.

a) Backfilling the final void

Backfilling the final void was considered during the mine planning process for the proposal. The removal of over 800 million bank cubic metres (Mbcm) of material would be required to fill the void to a similar level as the highwall crest. As under the proposal Warkworth Mine would complete mining in 2035, this material would need to be sourced from an alternative location.

One option would be to excavate the previously rehabilitated emplacements at Warkworth Mine. This process would take many years and use a large fleet of excavating equipment and trucks after mining was completed. This would initially increase the disturbance footprint of Warkworth Mine, as well as prolong its environmental impacts particularly those related to dust and noise, and would be prohibitively expensive.

Alternatively, material could be transported from elsewhere in the Hunter Valley. This would require considerable truck movements on public roads for several years that are not feasible. Similar to the above, this option is not considered desirable from a social, environmental or economic perspective (i.e. key objectives of the proposal) and, accordingly, was also discounted.

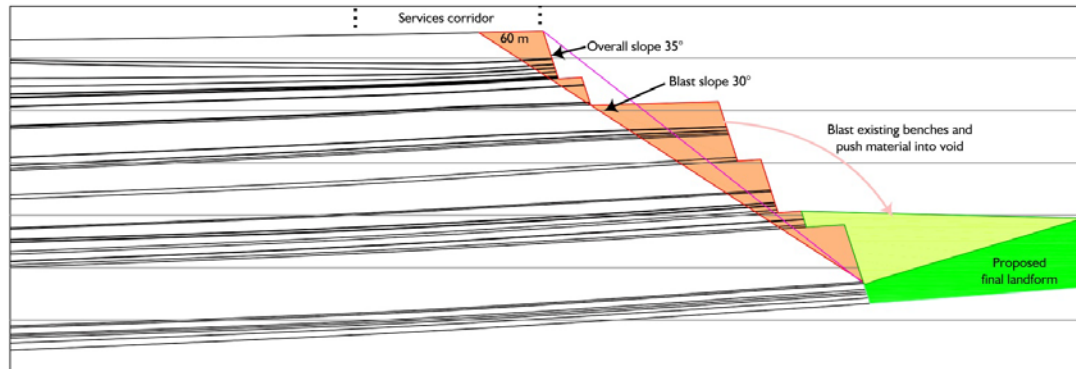
b) Reduction in final profile bench slope

The reduction in final profile bench slope was considered during the mine planning process for the proposal. This option comprised the blasting of the final profile benches to produce a reduced slope overall when compared to the preferred option that could be more conducive to rehabilitation. As shown in Figure 1, a typical final highwall profile at Warkworth Mine with an overall slope of approximately 35°, could be blasted to create a slope of approximately 30°. However, a 30° slope would be too steep to establish rehabilitated vegetation due to erosion of topsoil on such angles and does not accord with the mine's final landform objectives. The slopes would only enable aerial seeding. There would also be a risk of ongoing spontaneous combustion from coal seams disrupted by blasting.

Under the proposal the highwalls and endwalls have been left in their final mining profile to avoid further increases to the footprint of the operation being necessitated. It is noted that there is an opportunity for the final highwall and endwall benches to be re-vegetated as part of rehabilitation of Warkworth Mine. This vegetation would be classified as within

the final void footprint due to the steep nature of the walls between benches and, therefore, has not been considered in calculations for on-site re-vegetation.

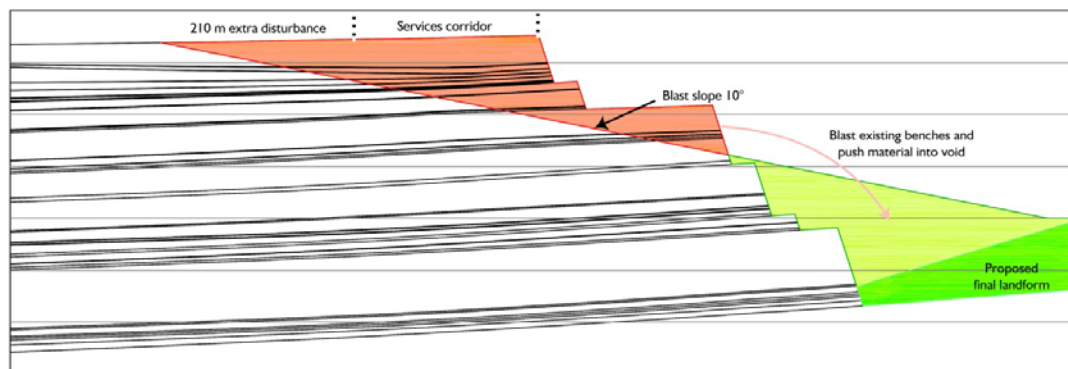
Figure 1 Representative cross-section of final highwall in North Pit showing minimal blasting of benches to achieve a shallower final void slope



c) Reduction in highwall and endwall slopes

Reshaping highwalls and endwalls to final landform slopes of 10° was considered during the mine planning process for the proposal. This option is shown in Figure 2. Under this option additional disturbance outside of the services corridor would be required. The disturbance would encroach on biodiversity offset areas to the north, various endangered ecological communities (EEC) to the west, and Putty Road to the south. The final landform would still contain a depression that would capture and store water. This option would prolong the rehabilitation process and, therefore, increase closure costs. For the preceding reasons, this option was discounted.

Figure 2 Representative cross-section of final highwall in North Pit overlaid with a final landform wall of 100 slope



d) Additional alternatives

Subsequent to DP&E's request for additional information, further scenarios considered during the mine planning process but not described in the EIS are documented below. Investigations considered the rehandling of 40 and 56Mbcm, respectively, from the emplacement areas adjacent to North and West Pit at Warkworth Mine for placement within the pit. An overview of these options is provided below. These provide further justification for the proposed final void demonstrating that alternatives are cost prohibitive, would result in the removal of significant areas of rehabilitation, and would provide little reduction in void surface area.

Option 1

Figure 1 in **Appendix C** provides a typical cross-section of North Pit showing the currently proposed and modified final landform that would result from the removal of 40Mbcm of material from emplacement areas adjacent to the pit and emplacement in the void. The figure also shows the resultant landform. This process would take approximately five years following the completion of mining using one EX5500 excavator. The depth of the void would be approximately 200m under this option. This option was discounted as:

- it would prolong the rehabilitation process and, therefore, increase closure costs;
- it requires the removal of 107ha of rehabilitation; and
- it results in only a minor reduction of the void surface area by approximately 19ha (at RL20).

Option 2

Figure 2 in **Appendix C** provides a typical cross-section of North Pit showing the currently proposed and landform resulting from the removal of 56Mbcm of material from emplacement areas adjacent to the pit being emplaced in the void. The figure also shows the resultant landform. This would take approximately seven years following the completion of mining using one EX5500 excavator. The depth of the void would be approximately 250m under this option.

This option was discounted as:

- it requires the removal of 107ha of rehabilitation;
- it would prolong the rehabilitation process, delaying 43ha of rehabilitation from the period 2028 to 2035 due the excavation of emplacements as opposed to reshaping them prior to 2035;
- it is cost prohibitive occurring at the cessation of mining when no revenue is generated by the mine; and
- it does *not* result in a reduction of the void surface area at RL20.

2.4. Summary

The proposals provide a feasible reduction in final voids across Mount Thorley Warkworth, by using overburden material extracted from Warkworth Mine to fill the final void at MTO. The net result is a one less void and reduction in currently approved final void surface area from 491ha to 445ha.

Further options were considered in the EIS and additional considerations have been undertaken in response to this information request, however are not feasible. Notwithstanding this, opportunities for further refinements will be considered as part of the mine closure plan that would be developed in advance of closure.

3. EPA air quality assessment clarifications

The EPA has requested further clarification on aspects of the air quality assessment response to submissions (RTS). This clarification is provided as follows:

- The air dispersion models operate using Eastern Standard Time (EST) and presented in the EIS in this format. Monitoring data presented in the EIS is based on unedited data (for transparency) in the Australian Eastern Daylight Time (AEDT) format.
- Predicted project and cumulative levels are presented in Section 9 and Appendix E of the EIS. The 24-hour PM10 predictions were based on future years relative to 2012. This is applied in Section 9.5 only of the EIS to assess cumulative levels for this particular parameter in strict accordance with EPA guidelines.
- The full year of data was applied to determine the cumulative 24-hour average PM10 level, and the complete results are presented and described in the EIS/RTS, as required per the guidelines. Although not required by the guidelines, the 2012 emissions inventory and modelling results are provided in Appendix D along with monitoring data in a graphical format.

There are no changes to the outcomes of the air quality assessments associated with the abovementioned clarifications.

Should you wish to further discuss this matter, please do not hesitate to contact the undersigned or Nicola Proctor on 02 6575 5925.

Yours sincerely



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Enc.

Appendix A	Air quality vacant land modelling
Appendix B	Privately-owned vacant lots
Appendix C	Alternative final void profile
Appendix D	Monitoring data & emission inventory

Appendix A

Air quality vacant land modelling

12 December 2014

Luke Stewart
Director
EMGA Mitchell McLennan
Via email: lstewart@emgamm.com

RE: Warkworth Continuation and Mount Thorley Operations – Dust mitigation strategy for short-term dust impacts

Dear Luke,

Todoroski Air Sciences have quantitatively assessed the effectiveness of the predictive/reactive dust mitigation strategies proposed by the Warkworth Continuation and Mount Thorley Operations to minimise potential short-term dust levels due to the proposed mining operations. This letter provides an update to the previous modelling results which did not quantify the dust levels that would arise from the use of predictive/ reactive dust management strategies.

In November 2014, the NSW Government changed its policy, making the air quality criteria for mining projects more stringent. Per the new policy, (draft Voluntary Land Acquisition and Mitigation Policy) there is now potential scope that the predicted elevated levels in the AQIA may exceed the new criteria, which does not permit any 24-hour average PM₁₀ level above 50µg/m³ due to the mine in isolation at sensitive receptor locations and on greater than 25% of vacant privately-owned land parcels. Thus it is considered prudent to quantify whether the new criteria would be met by the proposed Project when the originally proposed strategies are considered in the modelling results.

The dispersion modelling predictions presented in the *Air Quality and Greenhouse Gas Assessment Warkworth Continuation 2014* (**Todoroski Air Sciences, 2014a**) and the *Air Quality and Greenhouse Gas Assessment Mount Thorley Operations 2014* (**Todoroski Air Sciences, 2014b**) indicated the potential for elevated dust levels to occur in areas in particular to the northwest of Warkworth Mine and to the northeast of MTO.

Incremental 24-hour average PM₁₀ impacts are predicted to occur at some privately-owned receptor dwellings in Warkworth Village and is considered that acquisition is afforded to these properties. Applying the new policy, it is determined that there are no new impacts at any other privately owned sensitive receptor, however may be some impacts on greater than 25% of vacant privately-owned land parcels.

Predictive/ reactive mitigation strategies that would reduce these short term elevated dust levels were proposed in the AQIA, and the mine committed to implementing the strategies. Thus revised modelling

was conducted to incorporate these proposed mitigation measures, and to determine its effect in reducing short-term dust impacts on privately owned vacant land.

As stated in the respective AQIA's, Warkworth Mine and MTO have an integrated air quality management plan that include a range of air quality mitigation measures to achieve a standard of mine operation consistent with current best practice for the control of dust emissions from coal mines in NSW and includes the use of predictive/ reactive dust management strategies.

Predictive/ reactive dust mitigation strategies can be used to manage these short-term potential elevated dust levels. Such systems can predict the expected conditions on any given day and identify where and when over the coming day(s) that potentially elevated levels of dust may occur. This information means that the day's mining activities can be adjusted to minimise potential dust impacts by positioning fleet and restricting activities at certain times and/or within certain locations when meteorological conditions are adverse.

In conjunction with the predictive systems, real-time air quality monitoring systems are also used to implement reactive dust management measures. Reactive measures are in response changing operations, air dispersion and other factors which may lead to elevated dust levels. Reactive measures are used when pre-set dust trigger levels are recorded via the real-time dust monitoring.

The predictive system provides forewarning to the mine of a potential issue, and allows the mine to take pre-emptive actions to prevent dust emissions occurring in the first instance. The reactive system acts as a fail-safe, such that if a real-time response trigger level is exceeded, the Project would be required to undertake management actions such as relocating or shutting down plant until monitoring indicates that dust levels have fallen below the real-time response trigger.

To assess the effectiveness of these measures in mitigating the predicted worst case elevated dust levels, air dispersion modelling was conducted similarly to that used in the air quality assessment (**Todoroski Air Sciences, 2014a & 2014b**), except that the operation of a predictive/ reactive strategy was applied in the model.

This was coded conservatively in the modelling, generally per a likely reactive strategy, whereby mining activities were temporarily ceased after an elevated one-hour average or rolling 24-hour average level arose. It is important to note that:

- ✦ the modelling and analysis does not "erase" dust already in the air and allows this airborne dust to continue to travel towards receptors well after any mitigation actions are taken (as may occur in reality);
- ✦ the modelling is conservative, in that full operations continue for one hour after an elevated trigger level is reached. This is done to reflect the potential for delays in reacting to a trigger. (Note that a predictive strategy would have mitigation actions in place before the elevated level occurs, resulting in even lower levels than those presented in the analysis);
- ✦ the modelling does not simply remove high dust values from the predicted results, rather it considers the diurnally varying dust emissions correctly, adjusting only the mine sources that can be controlled by the mine, in response to elevated levels at monitors;



- ★ dust emissions due to wind erosion from the active areas and all activities associated with the CHPP were assumed to continue to operate at all times.

This modelling and analysis serves to demonstrate the proposed reactive dust mitigation measures that include cessation of activities associated with mining operations, whereas in reality Warkworth Mine and MTO would investigate and cease and/or relocate specific fleet as pro-actively and/or reactively required to minimise potential adverse dust impacts based on the predicted levels and/or real-time dust measures.

A comparison of the predicted 24-hour average PM_{10} levels with and without the implementation of a reactive dust mitigation strategy is presented in **Figures 1** to **Figure 4** for Year 3, 9 and 14 for Warkworth Mine and Year 9 for MTO respectively. For each of these figures, the predicted 24-hour average PM_{10} isopleth from the AQIA (without mitigation effects considered in the modelling) is overlaid with the revised isopleth (with consideration of mitigation effects) in order to clearly show the effects of implementing the proposed dust mitigation strategy.

The modelling results demonstrate that with the use of a predictive/ reactive mitigation strategy the short-term dust levels in areas to the northwest of Warkworth Mine and the northeast of MTO can be effectively reduced. It is therefore reasonable to conclude that the Projects can minimise and prevent the potential for adverse dust levels occurring at these locations.

Please feel free to contact us if you need to discuss (or require clarification on) any aspect of this report.

Yours faithfully,

Todoroski Air Sciences



Aleks Todoroski



Philip Henschke



References

Todoroski Air Sciences (2014a)

Air Quality and Greenhouse Gas Assessment Warkworth Continuation 2014", prepared for EMGA Mitchell McLennan by Todoroski Air Sciences, June 2014

Todoroski Air Sciences (2014b)

Air Quality and Greenhouse Gas Assessment Mount Thorley Operations 2014", prepared for EMGA Mitchell McLennan by Todoroski Air Sciences, June 2014



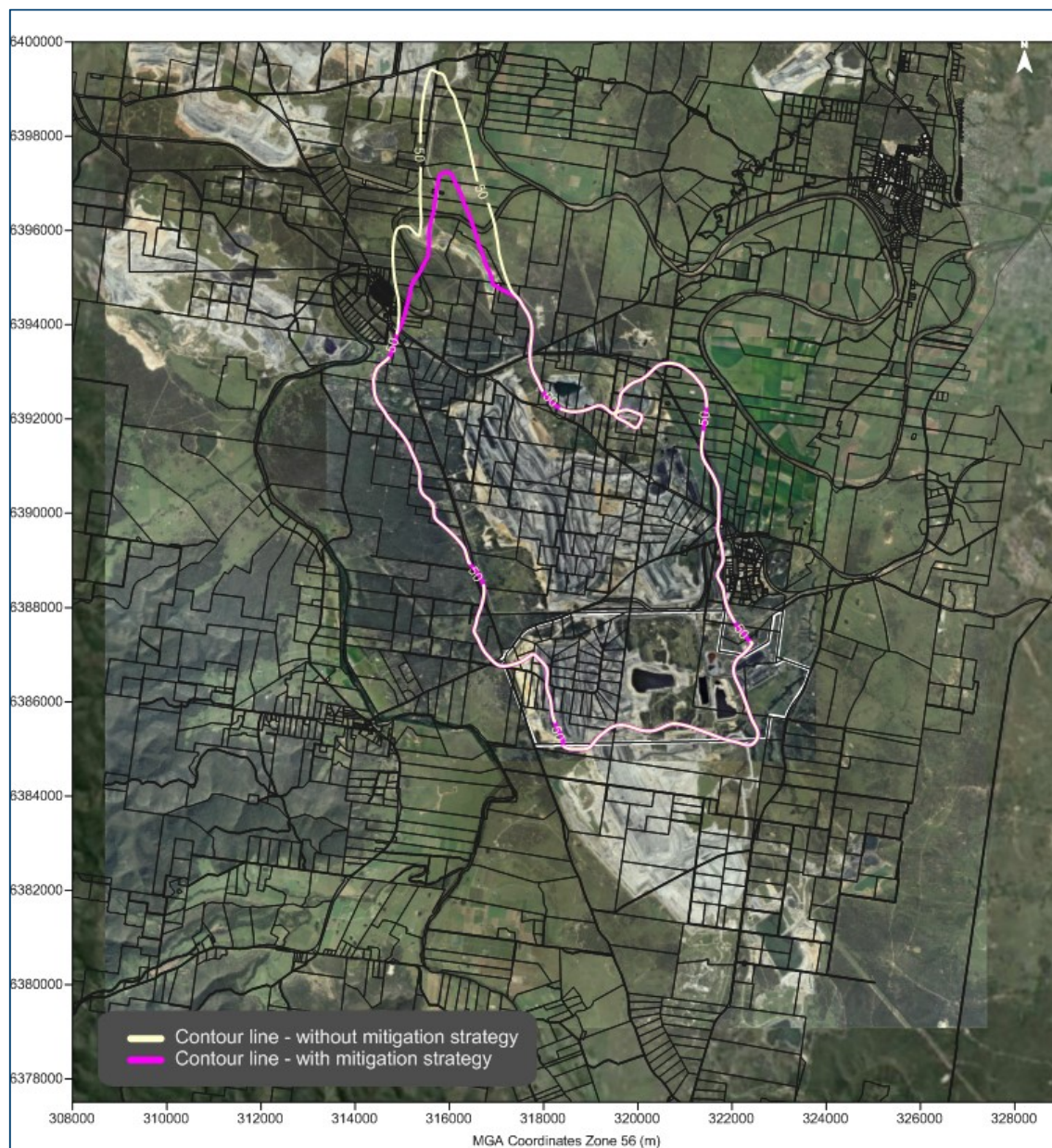


Figure 1: Comparison of predicted 24-hour PM₁₀ levels due to Warkworth for Year 3

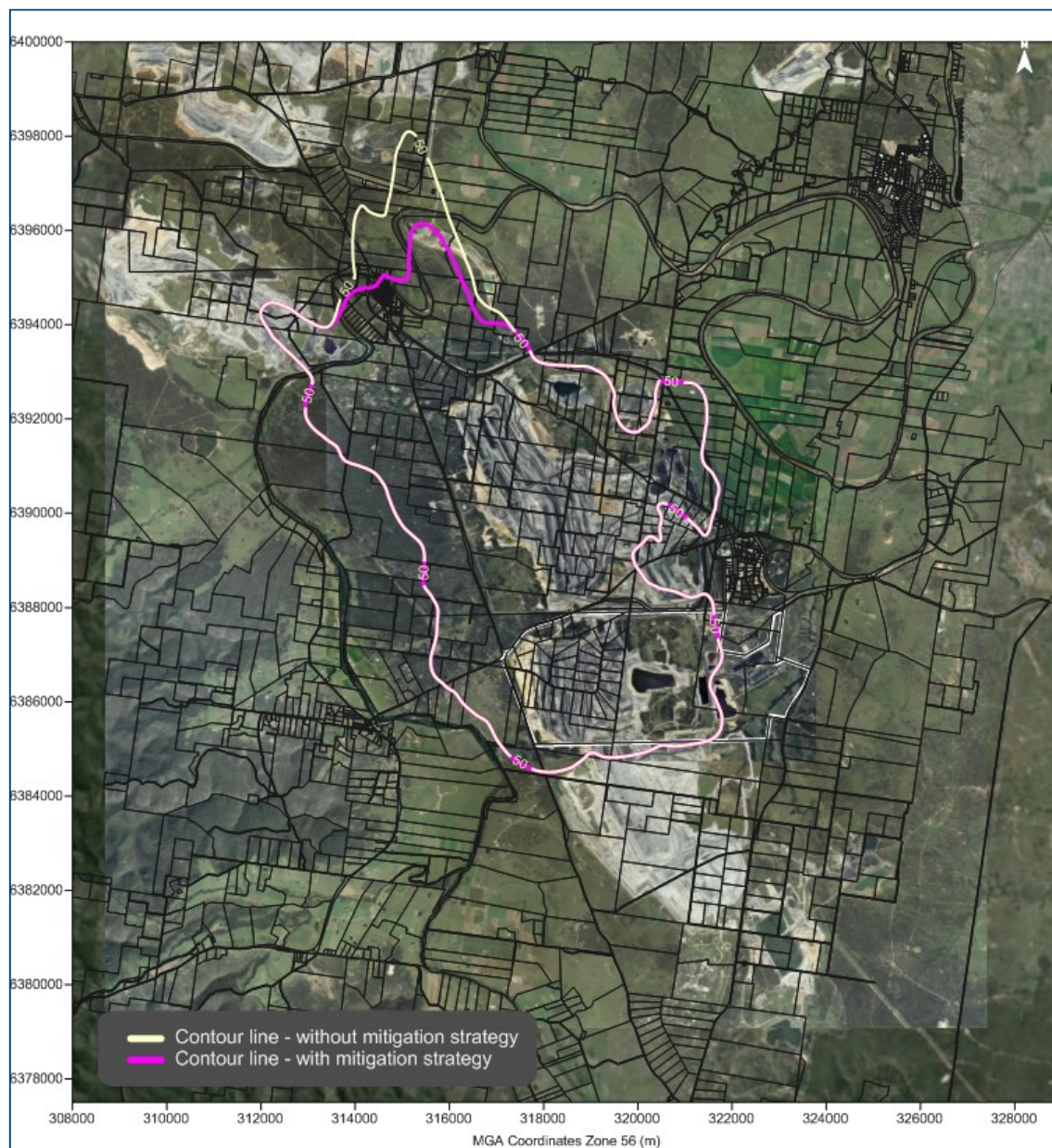


Figure 2: Comparison of predicted 24-hour PM₁₀ levels due to Warkworth for Year 9

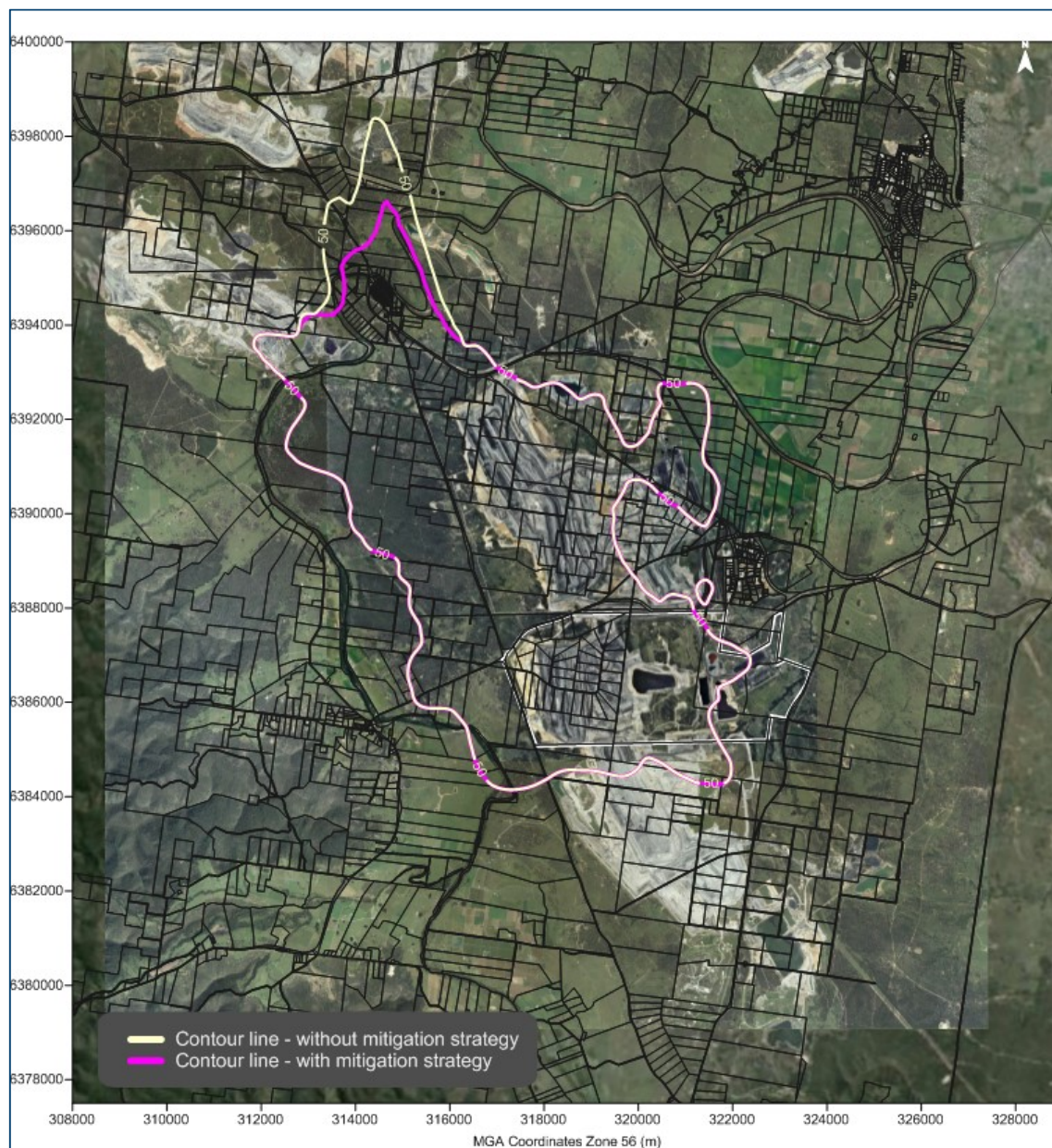


Figure 3: Comparison of predicted 24-hour PM₁₀ levels due to Warkworth for Year 14

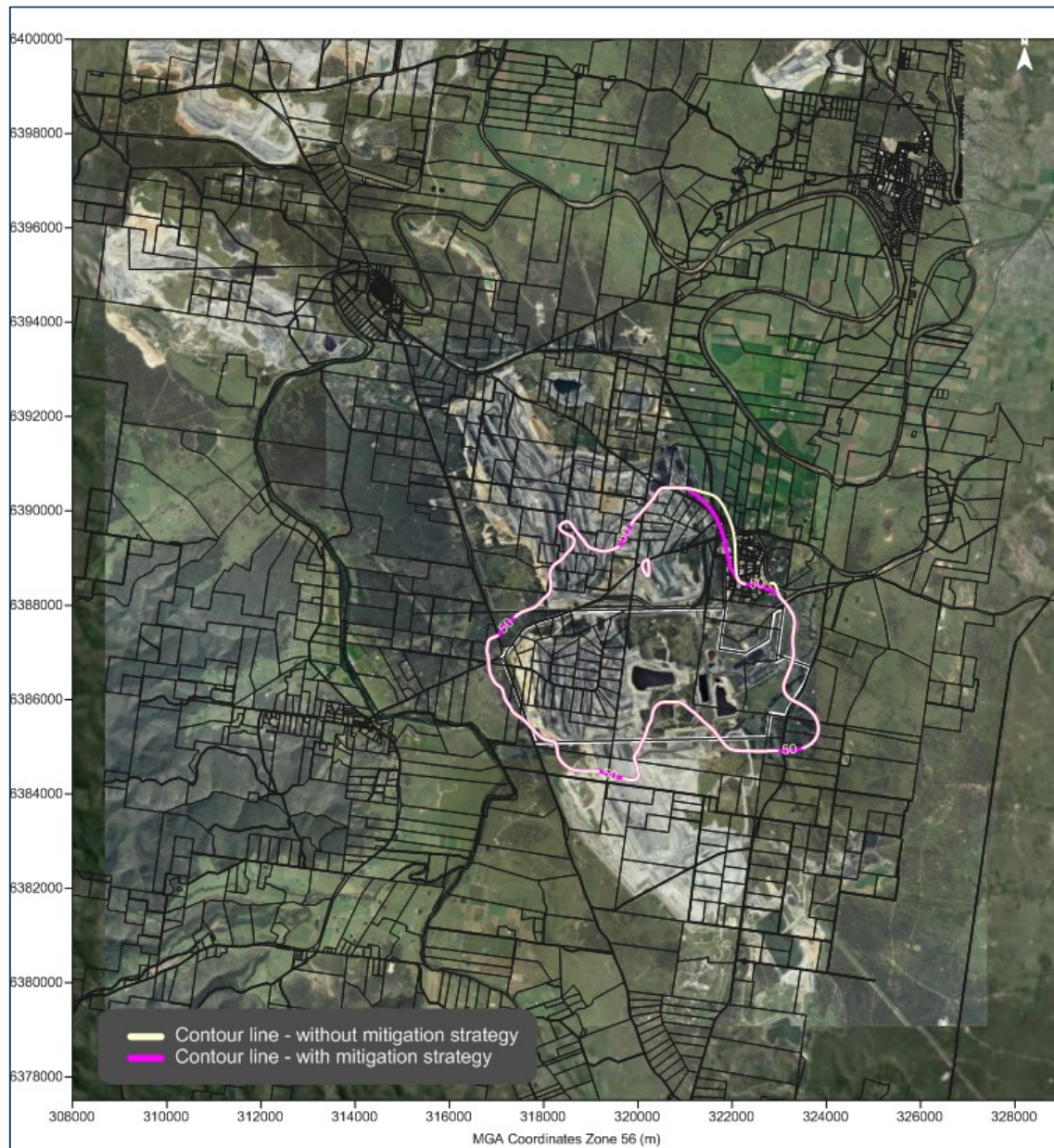
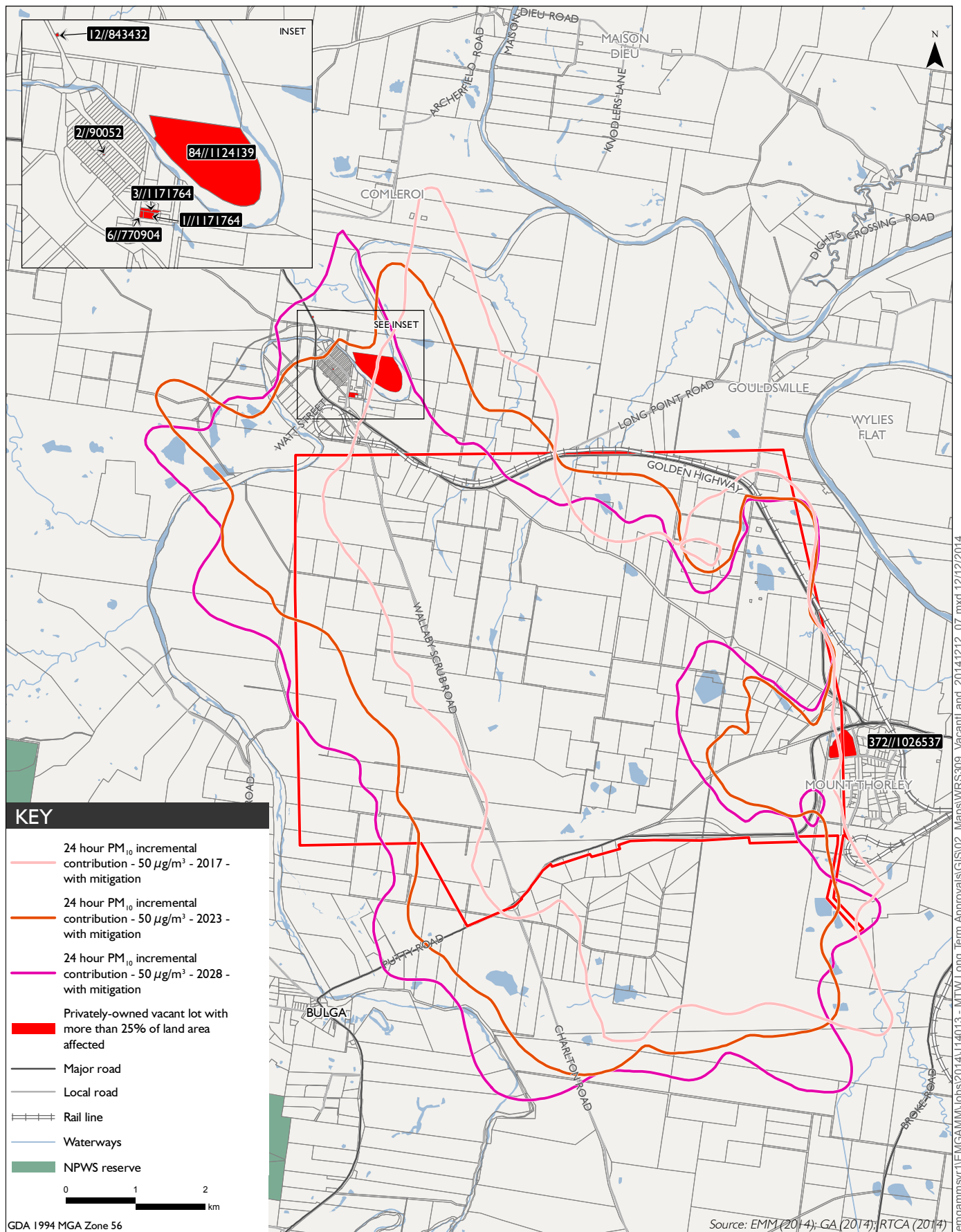


Figure 4: Comparison of predicted 24-hour PM₁₀ levels due to Mount Thorley for Year 9

Appendix B

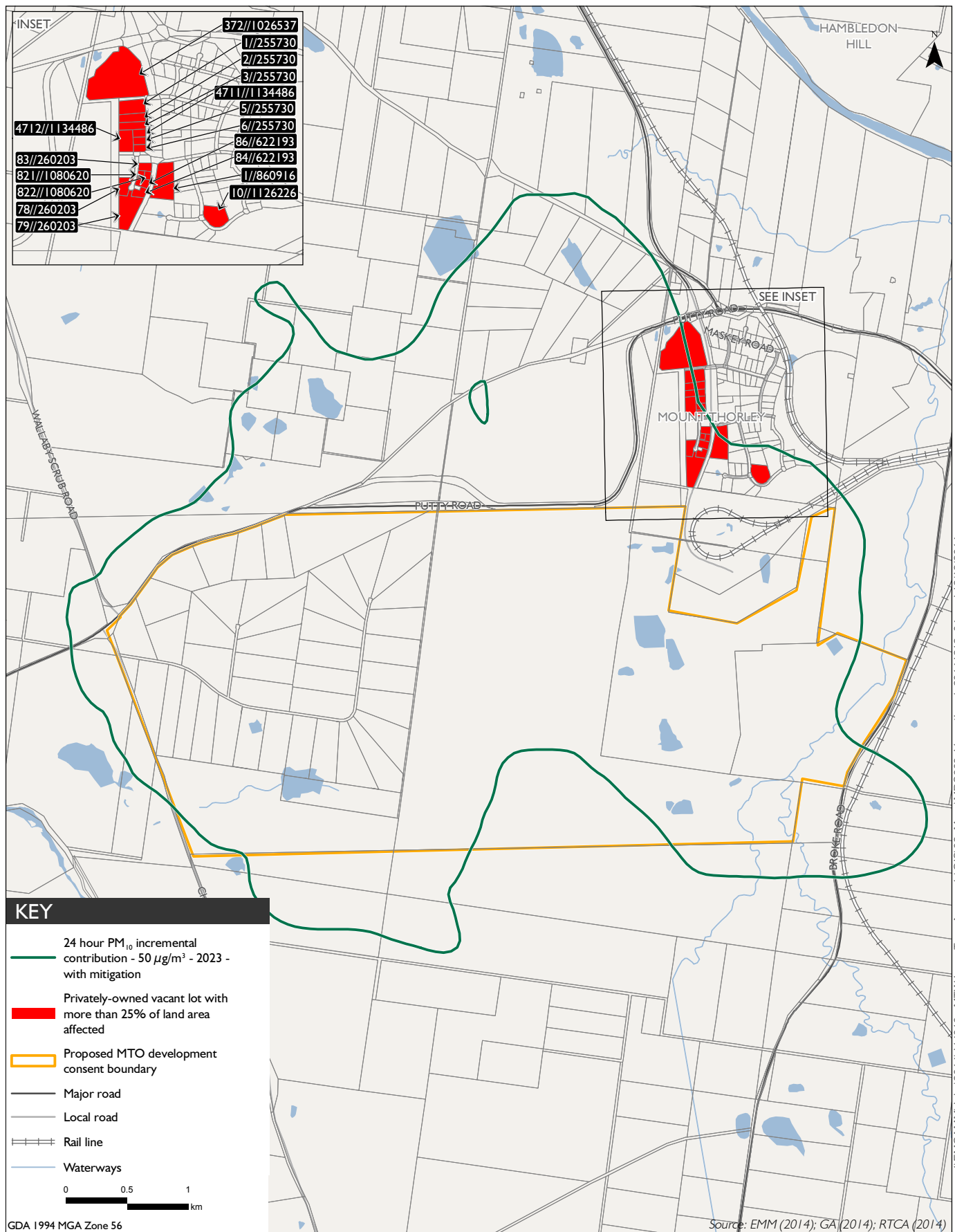
Privately-owned vacant lots



Warkworth 25% vacant land assessment

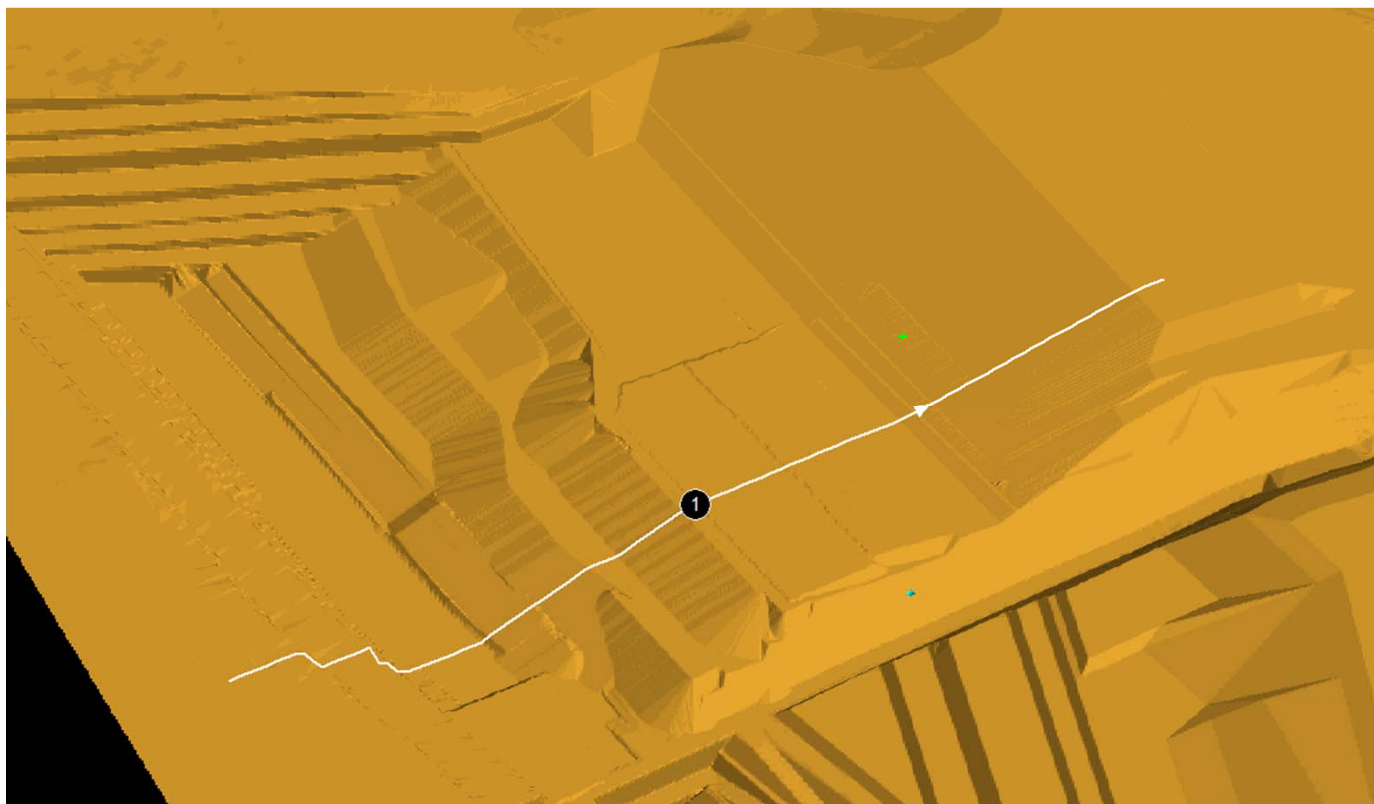
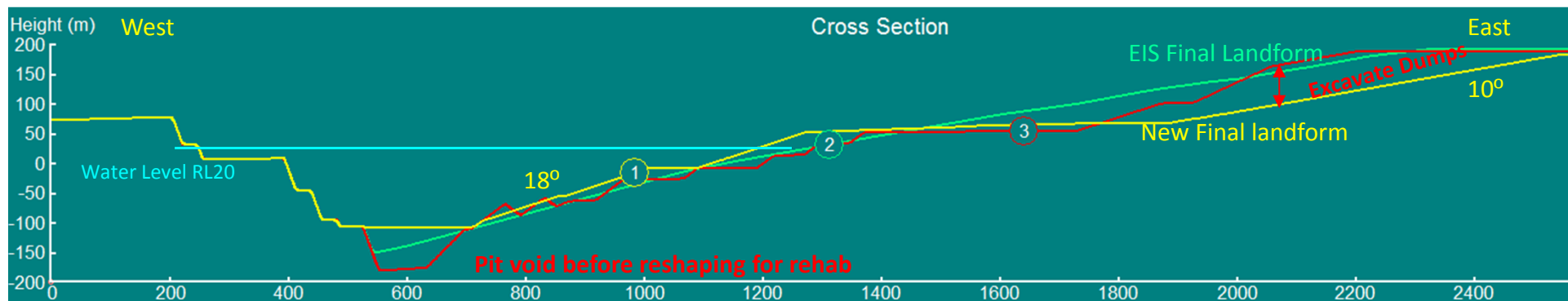
Warkworth Continuation 2014
Environmental Impact Statement

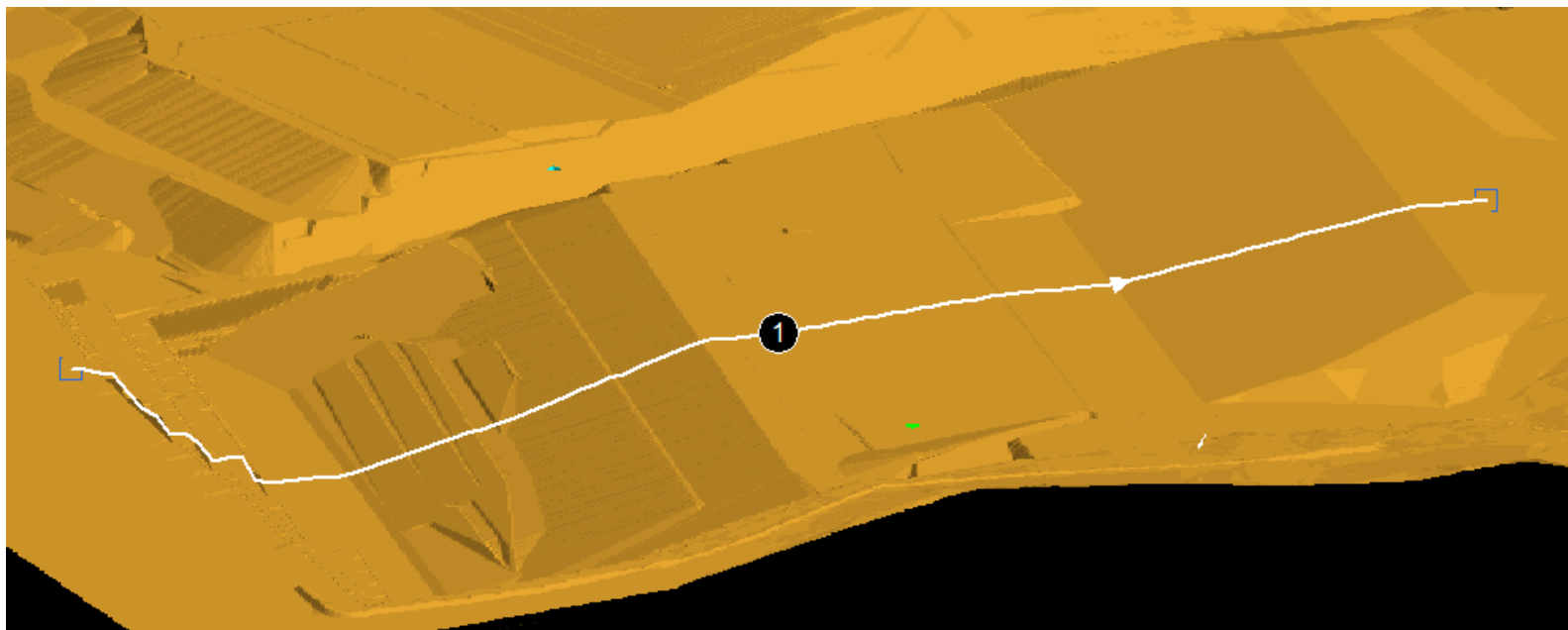
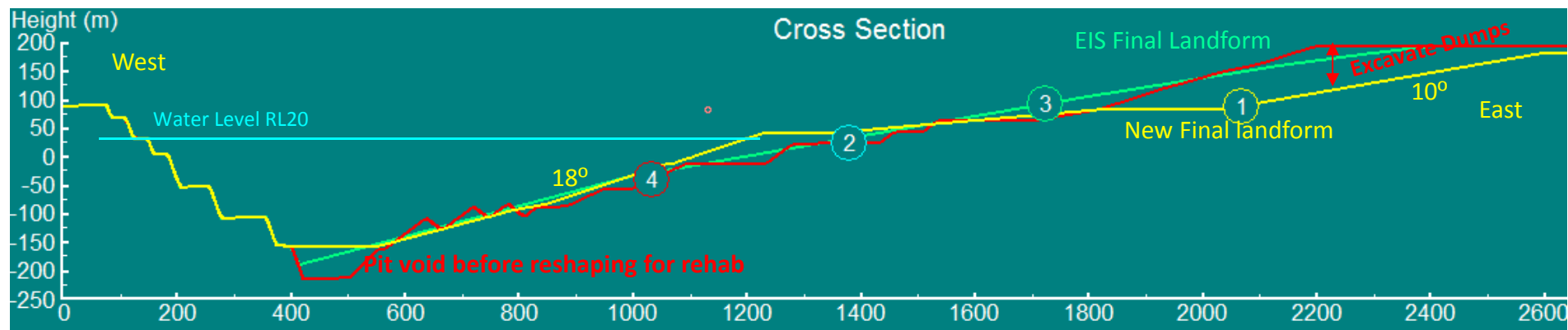
Figure I.1



Appendix C

Alternative final void profile





Appendix D

Monitoring data & emission inventory

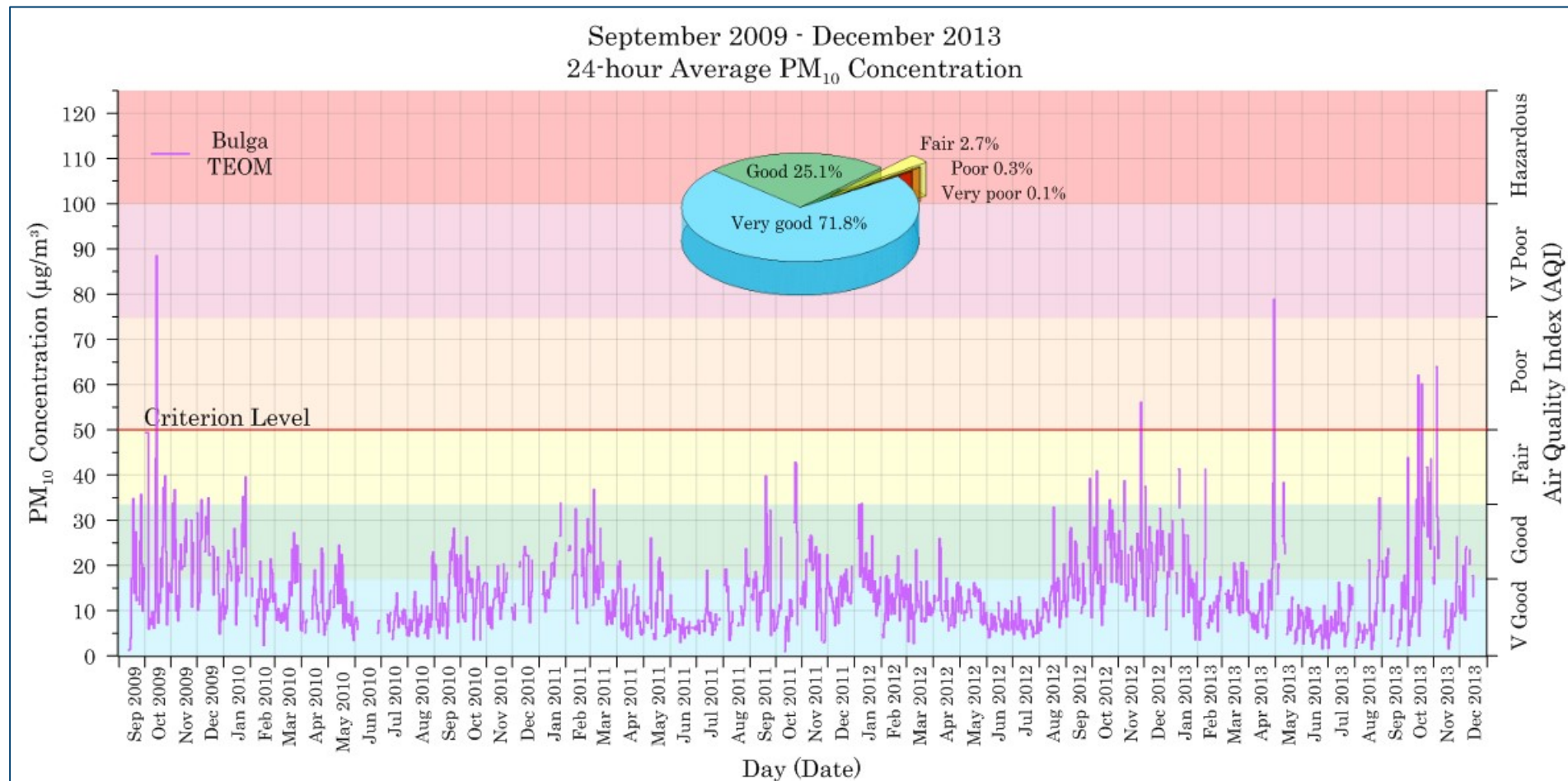


Figure 1: Measured 24-hour average PM₁₀ concentrations at MTW Bulga TEOM monitor



ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
Warkworth																	
OB - Dozers stripping topsoil	1,674	100	hours/year	16.7	kg/h	10	silt content in %	2	moisture content in %								
OB - Drilling	8,069	45,532	holes/year	0.58	kg/hole												70 % Control
OB - Blasting	377,241	330	blasts/year	1143	kg/blast	30,000	Area of blast in square metres										
OB - Dragline	994,907	31,313,090	bcm/year	0.032	kg/m ³	7	drop height in m										
OB - Loading OB to haul truck	149,886	88,431,507	tonnes/year	0.00170	kg/t	1,432	average of (wind speed/2.2) ¹										
OB - Hauling to emplacement area	1,399,208	88,431,507	tonnes/year	0.079	kg/t	240	tonnes/load	6.5	km/return trip	2.9	kg/VKT	1.8	% silt c	275	Ave GMV/(to	80	% Control
OB - Emplacing at area	149,886	88,431,507	tonnes/year	0.00170	kg/t	1,432	average of (wind speed/2.2) ¹										
OB - Dozers in pit	561,547	33,554.96	hours/year	16.7	kg/h	10	silt content in %	2	moisture content in %								
OB - Dozers on dump and rehab	198,474	11,860	hours/year	16.7	kg/h	10	silt content in %	2	moisture content in %								
CL - Drilling	818	27,265	holes/year	0.10	kg/hole												70 % Control
CL - Blasting	11,620	53	blasts/year	220	kg/blast	10,000	Area of blast in square metres										
CL - Dozers ripping/pushing/clean-up	146,608	4,262	hours/year	34.4	kg/h		8 silt content in %	7	moisture content in %								
CL - Loading ROM coal to haul truck	605,896	10,791,643	tonnes/year	0.056	kg/t		7 moisture content in %										
CL - Hauling ROM to hopper - Warkworth CHPP	143,253	7,159,880	tonnes/year	0.100	kg/t	190	tonnes/load	7.0	km/return trip	2.7	kg/VKT	1.8	% silt c	234	Ave GMV/(to	80	% Control
CL - Hauling ROM to hopper - Mt Thorley CHPP	74,739	3,631,763	tonnes/year	0.103	kg/t	190	tonnes/load	7.2	km/return trip	2.7	kg/VKT	1.8	% silt c	234	Ave GMV/(to	80	% Control
CHPP - Unloading ROM to hopper - Warkworth CHPP	60,299	7,159,880	tonnes/year	0.056	kg/t		7 moisture content in %										85 % Control
CHPP - Rehandle ROM at hopper - Warkworth CHPP	12,060	1,431,976	tonnes/year	0.056	kg/t		7 moisture content in %										85 % Control
CHPP - Dozer pushing ROM coal - Warkworth CHPP	42,997	1,250	hours/year	34.4	kg/h		8 silt content in %	7	moisture content in %								
CHPP - Dozer pushing Product coal - Warkworth CHPP	13,593	1,250	hours/year	10.9	kg/h		5 silt content in %	11	moisture content in %								
CHPP - Loading Product coal to stockpile - Warkworth CHPP	538	4,602,780	tonnes/year	0.00016	kg/t	1,432	average of (wind speed/2.2) ¹										25 % Control
CHPP - Loading Product coal to train - Warkworth CHPP	215	4,602,780	tonnes/year	0.00016	kg/t	1,432	average of (wind speed/2.2) ¹										70 % Control
CHPP - Loading rejects - Warkworth CHPP	451	2,531,357	tonnes/year	0.00018	kg/t	1,432	average of (wind speed/2.2) ¹										
CHPP - Hauling rejects - Warkworth CHPP	43,411	2,531,357	tonnes/year	0.096	kg/t	190	tonnes/load	6.0	km/return trip	2.7	kg/VKT	1.8	% silt c	234	Ave GMV/(to	80	% Control
CHPP - Unloading rejects - Warkworth CHPP	451	2,531,357	tonnes/year	0.00018	kg/t	1,432	average of (wind speed/2.2) ¹										
CHPP - Conveying to Redbank from Warkworth CHPP	1,047	1.0	ha	3.504	kg/ha/year												70 % Control
CHPP - Conveying to train load out from Warkworth CHPP	732	0.7	ha	3.504	kg/ha/year												70 % Control
WE - Overburden emplacement areas - Warkworth	1,393,880	795.6	ha	3.504	kg/ha/year												50 % Control
WE - Open pit - Warkworth	1,715,532	489.6	ha	3.504	kg/ha/year												
WE - ROM stockpiles - Warkworth	34,269	19.6	ha	3.504	kg/ha/year												50 % Control
WE - Product stockpiles - Warkworth	14,839	8.5	ha	3.504	kg/ha/year												50 % Control
Grading roads	110,784	180,000	km	0.62	kg/VKT		8 speed of graders in km/h										
Subtotal	8,268,931																
Mt Thorley																	
OB - Dozers stripping topsoil	1,674	100	hours/year	16.7	kg/h	10	silt content in %	2	moisture content in %								
OB - Drilling	4,963	28,039	holes/year	0.58	kg/hole												70 % Control
OB - Blasting	232,313	203	blasts/year	1143	kg/blast	30,000	Area of blast in square metres										
OB - Dragline	479,104	15,079,024	bcm/year	0.032	kg/m ³	7	drop height in m										
OB - Loading OB to haul truck	92,309	54,458,031	tonnes/year	0.00170	kg/t	1,432	average of (wind speed/2.2) ¹										
OB - Hauling to emplacement area	742,335	54,458,031	tonnes/year	0.068	kg/t	240	tonnes/load	5.6	km/return trip	2.9	kg/VKT	1.8	% silt c	275	Ave GMV/(to	80	% Control
OB - Emplacing at area	92,309	54,458,031	tonnes/year	0.00170	kg/t	1,432	average of (wind speed/2.2) ¹										
OB - Dozers in pit	345,813	20,664	hours/year	16.7	kg/h	10	silt content in %	2	moisture content in %								
OB - Dozers on dump and rehab	122,224	7,303	hours/year	16.7	kg/h	10	silt content in %	2	moisture content in %								
CL - Drilling	454	15,147	holes/year	0.10	kg/hole												70 % Control
CL - Blasting	6,455	29	blasts/year	220	kg/blast	10,000	Area of blast in square metres										
CL - Dozers ripping/pushing/clean-up	81,449	2,368	hours/year	34.4	kg/h		8 silt content in %	7	moisture content in %								
CL - Loading ROM coal to haul truck	336,609	5,995,357	tonnes/year	0.056	kg/t		7 moisture content in %										
CL - Hauling ROM to hopper - Mt Thorley CHPP	198,780	5,995,357	tonnes/year	0.166	kg/t	190	tonnes/load	11.6	km/return trip	2.7	kg/VKT	1.8	% silt c	234	Ave GMV/(to	80	% Control
CL - Hauling Warkworth ROM to hopper - Mt Thorley CHPP	47,750	3,631,763	tonnes/year	0.066	kg/t	190	tonnes/load	4.6	km/return trip	2.7	kg/VKT	1.8	% silt c	234	Ave GMV/(to	80	% Control
CHPP - Unloading ROM to hopper - Mt Thorley CHPP	50,491	5,995,357	tonnes/year	0.056	kg/t		7 moisture content in %										85 % Control
CHPP - Unloading Warkworth ROM to hopper - Mt Thorley CHPP	30,586	3,631,763	tonnes/year	0.056	kg/t		7 moisture content in %										85 % Control
CHPP - Rehandle ROM at hopper - Mt Thorley CHPP	16,215	1,925,424	tonnes/year	0.056	kg/t		7 moisture content in %										85 % Control
CHPP - Dozer pushing ROM coal - Mt Thorley CHPP	42,997	1,250	hours/year	34.4	kg/h		8 silt content in %	7	moisture content in %								
CHPP - Dozer pushing Product coal - Mt Thorley CHPP	13,593	1,250	hours/year	10.9	kg/h		5 silt content in %	11	moisture content in %								
CHPP - Loading Product coal to stockpile - Mt Thorley CHPP	723	6,188,863	tonnes/year	0.00016	kg/t	1,432	average of (wind speed/2.2) ¹										25 % Control
CHPP - Loading Product coal to train - Mt Thorley CHPP	289	6,188,863	tonnes/year	0.00016	kg/t	1,432	average of (wind speed/2.2) ¹										70 % Control
CHPP - Loading rejects - Mt Thorley CHPP	606	3,403,643	tonnes/year	0.00018	kg/t	1,432	average of (wind speed/2.2) ¹										
CHPP - Hauling rejects - Mt Thorley CHPP	33,077	3,403,643	tonnes/year	0.049	kg/t	190	tonnes/load	3.4	km/return trip	2.7	kg/VKT	1.8	% silt c	234	Ave GMV/(to	80	% Control
CHPP - Unloading rejects - Mt Thorley CHPP	606	3,403,643	tonnes/year	0.00018	kg/t	1,432	average of (wind speed/2.2) ¹										
CHPP - Conveying to train load out from Mt Thorley CHPP	318	0.3	ha	3.504	kg/ha/year												70 % Control
WE - Overburden emplacement areas - Mt Thorley	503,874	287.6	ha	3.504	kg/ha/year												50 % Control
WE - Open pit - Mt Thorley	720,420	205.6	ha	3.504	kg/ha/year												
WE - ROM stockpiles - Mt Thorley	30,748	17.6	ha	3.504	kg/ha/year												50 % Control
WE - Product stockpiles - Mt Thorley	24,743	14.1	ha	3.504	kg/ha/year												50 % Control
Grading roads	22,157	36,000	km	0.62	kg/VKT		8 speed of graders in km/h										
Subtotal	4,276,004																
Total TSP emissions (kg/yr)	12,544,935																



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16 December 2014

Mr Mike Young
Manager Mining Projects
Department of Planning & Environment
GPO Box 39
Sydney NSW 2001

Dear Mr Young

Warkworth Continuation Project (SSD 6464) - Satisfaction of the recommendation made by Chief Executive of OEH

The biodiversity offset strategy (BOS) for the Warkworth Continuation 2014 proposal was certified by the Chief Executive of Office of Environment and Heritage (OEH) on 4 November 2014. The recommendation stated:

Certify under clause 14 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 that the measures to mitigate or offset the biodiversity impact of the Warkworth Continuation Project, described and evaluated at Parts 4 and 5 of this report, including the additional land based offset of equal or greater biodiversity value to the 72ha of Warkworth Sands Woodland EEC impacted by the Warkworth Continuation Project, are adequate;

AND

Recommend to the consent authority that an additional land based offset of equal or greater biodiversity value to the 72ha of Warkworth Sands Woodland EEC impacted by the Warkworth Continuation Project should be required.

This letter has been prepared to inform the Department of Planning and Environment (DP&E) that subsequent to its preliminary review of the merits of the application, Rio Tinto Coal Australia has reached agreement on acquiring a land based offset that satisfies the recommendation to the consent authority given in the BOS certification.

The land based offset is known as Hanwood Estate located near North Rothbury as shown in Appendix A. The OEH have confirmed that the Hanwood Estate's inclusion in the BOS fully satisfies the recommendation to the consent authority for the additional land based offset.

The biodiversity values of Hanwood Estate include:

- Hunter Lowland Redgum Forest in the Sydney Basin Bioregion;
- Central Hunter Ironbark ,Spotted Gum, Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions; and
- the largest subpopulations of the critically endangered plant *Persoonia pauciflora*.

By securing the site for conservation it will make a significant contribution to the protection and recovery of the critically endangered *Persoonia pauciflora*.

The land will be secured in perpetuity under a conservation mechanism such as entering into a biobanking agreement, in accordance with the relevant provisions of the NSW *Threatened Species Conservation Act 1995* and condition 30 of the current draft development consent.

Should you wish to further discuss this matter, please do not hesitate to contact Nicola Proctor on 02 6575 5925 or the undersigned.

Yours sincerely,



Anthony Russo
Manager – Project Approvals
HSEC, Coal Australia

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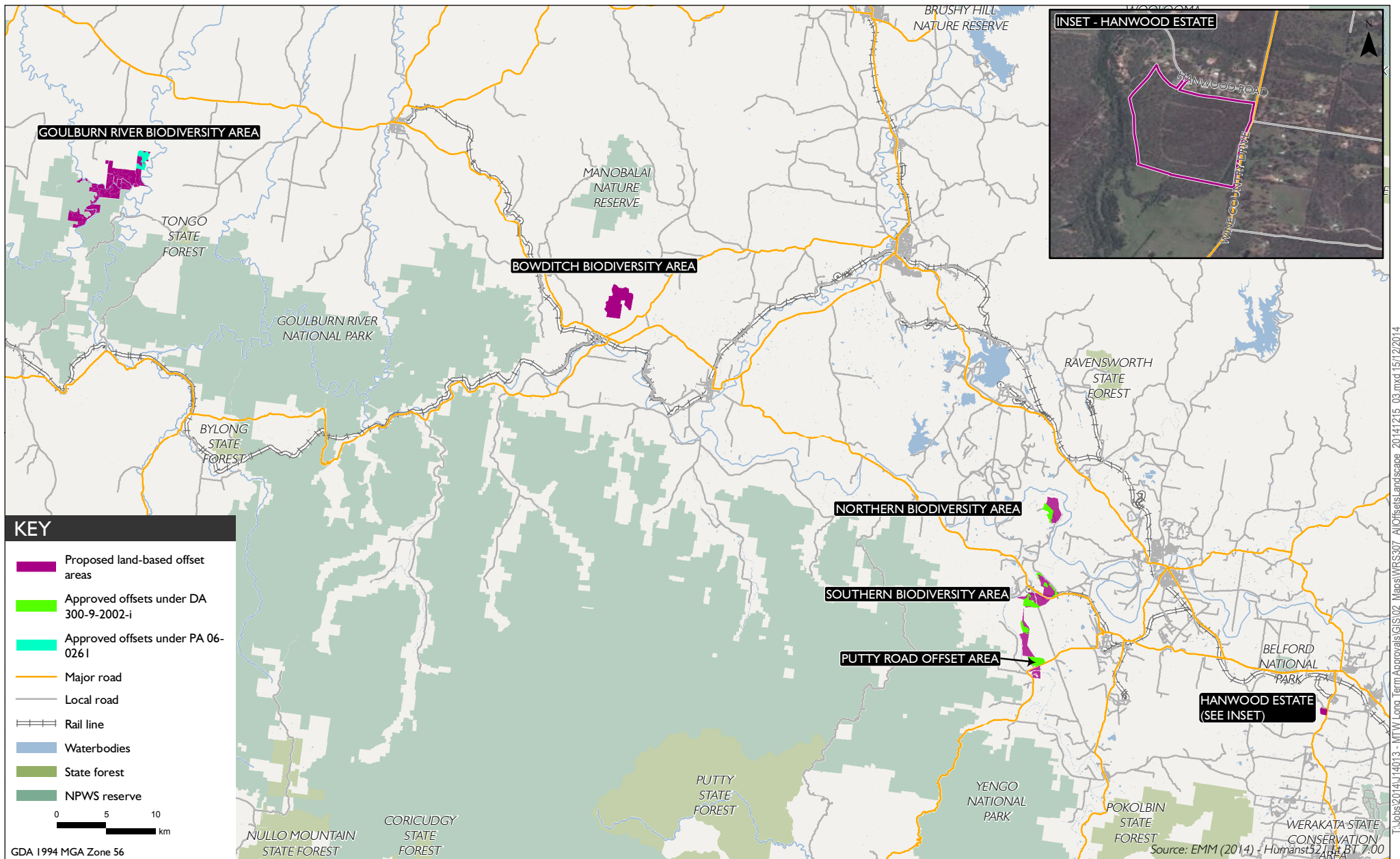
E: anthony.russo@riotinto.com

Enc.

Appendix A Land-based offset areas, including the Hanwood Estate

Appendix A

Land-based offset areas, including the Hanwood Estate



Existing consents and proposed land-based offset areas

Warkworth Continuation 2014

Rio Tinto Coal Australia Pty Limited
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9 January 2015

Mr Paul Forward
Planning and Assessment Commission
GPO Box 3415
Sydney 2001

Dear Mr Forward

Request for Information for Warkworth Continuation Project (SSD 6464) and Mt Thorley Continuation Project (SSD 6465)

I would like to take this opportunity to thank the Planning Assessment Commission (PAC) for undertaking a site visit of the abovementioned proposals on 9 December 2014.

During the visit, the PAC requested a matrix of the New South Wales (NSW) Government policies that have been considered and changed since the Warkworth Extension 2010 proposal and how the projects comply with these policies. This has been completed and the required matrix is enclosed as **Attachment 1**. As the material outlines, these projects fully comply with all relevant NSW Government policies.

We would also like to take this opportunity to clarify some of the statements made at the public hearing that was held on 18 and 19 December 2014. These clarifications are provided below.

Lawfulness of the project applications - at the PAC hearing reference was made to legal advice provided to the proponent by Minter Ellison in May 2013 with regards to making new applications for the projects. The advice provided by Minter Ellison was based on the laws and policies in place at that time. In the intervening period there have been a number of changes to legislation and policies in NSW. The applications made for the proposals have been made under the changed legislation and policies (including a different part of the *Environmental Planning and Assessment Act 1979*). Further, the proposal incorporates changes from the previous application as outlined in the Environmental Impact Statement (and summarised at a high level in **Attachment 2**). Given all of the above, there is no basis for the view that the lodgement of the applications for the proposal is unlawful.

Ecology - the Warkworth Sands Woodland (WSW) community is not protected under Commonwealth legislation as claimed by Mr Krey (speaking on behalf of Mr Bell), therefore it is a matter for consideration by the State of NSW. Ecological surveys for species and communities were undertaken in accordance with the NSW Biodiversity Offset Policy for Major Projects. The Biodiversity Offset Strategy to offset the impact of the proposal, including the clearing of WSW, has been certified by the relevant Government agency, the NSW Office of Environment and Heritage (OEH).

Air quality - the air quality assessment was completed as per the NSW Environmental Protection Authority (EPA) Approved Methods, 2005, and to a standard similar to recent PAC determinations for other projects in the Hunter Valley.

Noise - the noise assessment was undertaken in accordance with the Industrial Noise Policy as confirmed by the relevant Government Agency, the EPA. Mr Gould's presentation was remiss in not referring to the Low Frequency Noise (LFN) predictions for the proposal included in the Response to Submissions, which found the levels to be below the LFN trigger threshold. Despite Mr Gould's assertions, the effect of Saddleback Ridge was considered under both calm and adverse weather conditions. The assessment found the ridge provided negligible benefits to noise levels under adverse weather conditions and only marginal attenuation when calm conditions prevail. Crucial to understanding the effect of Saddleback Ridge, is the fact that calm conditions occur less than 2 per cent of an average year; noise levels under calm conditions following removal of the ridge are all predicted to be below the project specific noise levels (refer Table D.1, Appendix F of the EIS).

Social - the social impact assessment was undertaken in accordance with the Secretary's requirements and considered the subjective experience of near neighbours, in particular Bulga and surrounds, with the objective outcomes from the technical assessments. This is as required by the judgment in the Land and Environment Court decision.

Cultural heritage - all 82 registered aboriginal parties (RAPs) including the Plains Clans of the Wonnarua Peoples (PCWP) have been appropriately consulted as confirmed by OEH in their submission letter dated 8 August 2014. Dr Cotter's concern with the location of the Bulga Bora Ground was responded to in the Response to Submissions. The OEH acknowledge the location of the Bulga Bora ground as reported by the proponent in the EIS.

Economics - Mr Campbell made certain statements about the current and future viability of MTW. MTW is currently cashflow positive in a low coal price cycle. The proposals have a positive net present value. The extension is urgently required to ensure the ongoing viability of MTW. The independent economic review commissioned by the Department of Planning and Environment (Deloitte) found the economics assessment provides a broadly robust coverage of the main impacts of the proposal and is in sufficient detail to provide decision makers with relevant information on parties which may be adversely affected. The resource is unquestionably economically significant as confirmed by NSW Trade and Investment.

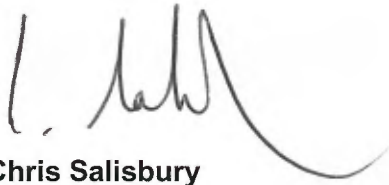
In summary, I would like to reiterate why these projects should be approved and are in the public interest -

- All applicable NSW Government policies are satisfied.
- The relevant Government agency, the Department of Planning and Environment, has recommended approval of the proposals with stringent conditions.
- The resources within the footprint of the proposals are significant, as confirmed by NSW Trade and Investment.
- The Mining SEPP non-discretionary standards are met at Bulga and surrounds.
- The Biodiversity Offset Strategy is certified by the Office of Environment and Heritage.

- The proposal has a net benefit to the State and local communities.
- Over 85 per cent of submissions support the social and economic benefits associated with the proposal.
- The combined operations provide employment for a significant workforce of approximately 1,300 people, on average, including full time contractors and are longstanding members of the Singleton community since operations commenced in 1981.

I would like to once again thank the PAC for your time and consideration. If the PAC requires any further information or clarification to complete its review, please do not hesitate to contact Anthony Russo, Manager - Projects Approvals on 07 3625 4823.

Yours sincerely



Chris Salisbury
Managing Director

Enclosures

Attachment 1	Matrix of NSW Government Policies
Attachment 2	High Level Summary of Changes from 2010 Application

Attachment 1

Matrix of NSW Government Policies

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
Noise and vibration	Mining SEPP	Existing	Addition of clause 12AB regarding non-discretionary standards	Section 7.2.4 of the EIS describes the proposal's compliance with the non-discretionary standards. The proposal satisfies - • cumulative amenity noise level for private dwellings not already afforded acquisition rights; • airblast overpressure levels at all privately-owned assessment locations; • ground vibration levels at all privately-owned assessment locations. It is noted that all residences in Bulga are predicted to be below the Mining SEPP's cumulative noise limit from all industrial noise sources. Compliance with the Mining SEPP's cumulative noise limit is accepted as providing significant protection against noise impacts. This means that the total impact from all mines at Bulga would meet all relevant regulatory amenity criteria. The Secretary's environmental assessment report notes: [Warkworth] "would remain below the recommended amenity criteria for a rural area in the Industrial Noise Policy at all privately-owned residences surrounding the mine that do not have existing acquisition rights, and therefore below the non-discretionary standards in the Mining SEPP". The assessment also notes: "MTO would be implementing all reasonable and feasible noise mitigation measures; the Department considers the potential noise impacts of the project to be acceptable".

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
	Voluntary Land Acquisition and Mitigation Policy (VLAM Policy)	New policy (November 2014)	-	Two privately-owned residences are predicted to be entitled to acquisition under the VLAM. One of the properties is to the north of Bulga; the other in Warkworth village, which is already entitled to acquisition upon request under Wambo Mine's development consent. The proposal's contribution to the latter is ~ three per cent. There are no privately-owned vacant lots with more than 25 per cent of land predicted to be affected, where construction of a dwelling is permissible under existing planning controls.
	NSW Road Noise Policy	New policy (March 2011)	-	Changes to traffic noise associated with the closure of Wallaby Scrub Road were assessed against the EPA's Road Noise Policy (RNP). Results indicate that existing levels of night-time traffic noise from Putty Road, Charlton Road and the Golden Highway is already above the night-time criteria. The closure of Wallaby Scrub Road would increase current noise levels in these locations by 0.3dB(A), which is within the allowable incremental increase of 2dB(A) in the RNP. Daytime traffic noise complies with the daytime RNP criteria for all receivers.
Air quality	Mining SEPP	Existing	Addition of clause 12AB regarding non-discretionary standards	Section 7.2.4 of the EIS describes the proposal's compliance with the non-discretionary standards which preserve amenity and health. The proposal satisfies cumulative annual average level (30µg/m³ of PM₁₀) for private dwellings not already afforded acquisition rights. The Secretary's environmental assessment report notes: "that the amenity and health impacts of the project have been minimised as far as practicable".
	Voluntary Land Acquisition and Mitigation Policy (VLAM Policy)	New policy (November 2014)	-	The proposal is predicted to comply with all relevant criteria at privately-owned residences surrounding the project, with the exception of one receiver. This receiver is entitled to acquisition upon request under Wambo Mine's development consent. There are no privately-owned vacant lots with more than 25 per cent of land predicted to be affected where construction of a dwelling is permissible under existing planning controls.

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
Biodiversity	Mining SEPP	Existing	Addition of clause 14(3)	The OEH has extensively considered and assessed the biodiversity offset strategy and provided certification of this strategy in accordance with clause 14(3) of the Mining SEPP. Section 2.4 of the RTS describes the biodiversity impact assessment, offset strategy and certification. The OEH certification document is provided in Appendix L of the RTS.
	NSW Biodiversity Offsets Policy for Major Projects	New Policy (September 2014)	-	The OEH considered the biodiversity offset strategy (inclusive of the requirement for additional offsets) consistent with the Policy and certified the strategy accordingly (refer to page 16 of the certification in Appendix L of the RTS).
Water resources	Mining SEPP	Existing	Addition of clause 12AB regarding non-discretionary standards	Section 7.2.4 of the EIS describes the proposal's adherence to non-discretionary standards. The proposal satisfies the non-discretionary development standards relating to aquifer interference.
	NSW Aquifer Interference Policy (AIP)	New Policy (September 2012)	-	Compliance with the AIP was outlined in Section 9 of the groundwater study (EIS Appendix K) and includes - • accounting for, or preventing the take of water; • determining water predictions in accordance with the AIP; • other requirements to be reported in accordance with the AIP. The Secretary's environmental assessment report notes: "Both the Department and NOW consider that the project would not have any significant impacts on surface water and groundwater resources in the locality, over and above the impacts associated with the existing approved project".

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
	Water Management Act 2000	Existing	Various	As outlined in Section 16.3.3 of the EIS, sufficient water licences would be held by the applicant to account for any water take during mining. If required upon mine closure, licences held for water take would be surrendered in perpetuity. Accordingly, there would be no net loss and no effect on water security. The Secretary's environmental assessment report notes: "The Department is satisfied that the proposed surface water management system is consistent with best practice management standards and would enable the project to avoid any significant impacts on surface water resources".
	Hunter River Salinity Trading Scheme (HRSTS)	Existing	-	Section 7.3.3 of the EIS states "The proposal would not require additional HRSTS credits to be purchased". The Secretary's environmental assessment report notes: "Although no uncontrolled releases from the site are predicted, the site water balance modelling indicates controlled discharges of additional volumes of excess saline water may be required for the project. This water would continue to be discharged into the Hunter River under the rules of the HRSTS".

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
Social	None available.	-	Secretary's requirements require an assessment of the likely social impacts of the development (including perceived impacts), paying particular attention to any impacts on Bulga village	Section 4.2 of the Social Impact Assessment references the regional context and strategy documents at a Commonwealth, State and local level relevant to the project. The Secretary's environmental assessment report notes: "From a social perspective, the Department notes that amenity impacts (dust and noise) on Bulga village would be limited, with only one property in the village located within the acquisition zone due to noise impacts from the project. ... "Overall, the Department is satisfied that the project would enable the significant benefits of the project to be realised, which would outweigh the residual costs of the project for the local community as a whole. The Department is also satisfied that subject to the provision of a suitable VPA with Council, together with the funds committed by the NSW Government for the Singleton LGA, for the continued demand for community services and infrastructure created by the project."
Land and soils capability	Strategic Regional Land Use Policy, including the Upper Hunter Strategic Regional Land Use Plan	New Policy (September 2012)	-	The closest mapped biophysical strategic agricultural land (BSAL) is greater than 3km away from the proposed 2014 disturbance area. The proposed 2014 disturbance area is not mapped as, nor does it meet the requirements for, BSAL to which the Policy applies. The proposal will not impact on any Critical Industry Clusters as defined under the Policy. The proposal would allow for the filling of the approved Mount Thorley void with overburden material from Warkworth Mine and a reduction in the approved Warkworth Mine final void from 491ha to 445ha. This is confirmed in correspondence to the Department of Planning and Environment on 15 December 2014.

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
Significance of the resource	Mining SEPP	Existing	Clause 12AA - the “significance of the resource” is the principal consideration of the matters the Minister is to consider under Part 3 of the Mining SEPP	It is clear that the proposal provides significant economic benefits. The benefits of MTW include annual average employment of almost 1,300 full time people, approximately \$6.1 billion in additional expenditure (including capital investment), and over \$617 million in royalties. An assessment of the proposal against Clause 12AA is given in Section 7.2.3iia of the EIS. Department of Trade and Investment provided written advice to the Department of Planning and Environment about the relative significance of the resource. This advice confirms that the project’s coal resource is significant, and forms part of an area to the south-west of Singleton where mining has been occurring for more than 30 years.
	Guideline for the use of Cost Benefit Analysis in mining and coal seam gas proposals	New (November 2012)	-	Section 9.3.1 of the EIS explains how this guideline was used. The Secretary’s environmental assessment report notes: “Overall, the Department is satisfied that the project would enable the significant benefits of the project to be realised, which would outweigh the residual costs of the project for the local community as a whole. The Department is also satisfied that subject to the provision of a suitable VPA with Council, together with the funds committed by the NSW Government for the Singleton LGA, for the continued demand for community services and infrastructure created by the project”.
	Guideline for economic effects and evaluation in EIA	Existing	No changes	Section 9.3.1 of the EIS explains how this guideline was used.
	Guideline for Economic Appraisal	Existing	No changes	Section 9.3.4 of the EIS describes how this guideline was adhered to.

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
Aboriginal Cultural Heritage	Aboriginal Cultural Heritage Consultation Requirement for Proponents	New (April 2010)	-	Section 18.3.1 of the EIS describes the projects adherence to this policy. The Secretary's environmental assessment report notes: "Both the Department and OEH are satisfied that the Aboriginal heritage assessment and consultation for the project has been undertaken in accordance with applicable guidelines, including the OEH's Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010)".
	Part 6, National Parks & Wildlife Act 1974 (NP&W)	Existing	Various	As stated in Section 7.3.7 of the EIS, the proposal would impact a number of Aboriginal sites. However, an Aboriginal heritage impact permit under section 90 of the NP&W Act is not required for State Significant Development. The Secretary's environmental assessment report notes: "Overall, the Department is satisfied the project's residual impacts are unlikely to have a significant impact on the Aboriginal heritage values of the region".
Historic Heritage	S.139, Division 9, Heritage Act 1977	Existing	Various	Section 19.2.2 of the EIS shows the assessments adherence to this Act. The Secretary's environmental assessment report notes: "the Department considers that the project would not result in any significant impacts on the historic heritage "values of the locality".
Traffic	Guide to Traffic Generating Development (RTA)	Existing	No change	Section 20.1 of the EIS indicates the adherence to this guide. The Secretary's environmental assessment report notes: "The Department is satisfied that the local and regional road network is capable of accommodating the traffic associated with the project, including the closure of Wallaby Scrub Road, subject to the identified upgrade".

Aspect	NSW Policy	New or existing policy	Changes in policy since 2010 application	Proposal adherence to the policy
Final Landform and rehabilitation	ESG3: Mining Operations (MOP) Guidelines	New (September 2013) Replacement of previous MOP guidelines	-	Section 13.4.4 of the EIS describes the compliance with these guidelines. The Secretary's environmental assessment report notes: "The Department is confident that the visual impacts from the project would be reduced in the short to medium term for many of the impacted residents, in particular those on lower lying properties along the Inlet Road and Putty Road. However, even with the implementation of these measures, the visual impacts for some residents in the elevated parts of Bulga and surrounds would remain high. In the longer term, as the site is rehabilitated, these impacts would improve significantly".

Attachment 2 High Level Summary of Changes from 2010 Application

Aspect	Change
General	• Changed legislation and policies as outlined in Attachment 1. • Excludes 350m section that was approved under modification 6. • Accesses Mount Thorley Mine coal to the north of Putty Road from Warkworth Mine, avoiding the need to relocate Putty Road. • Filling the Loders Pit void at Mount Thorley with overburden from Warkworth Mine resulting in one less void across MTW and a reduction of final void surface area. • An optional underpass for the approved but yet to be constructed overpass.
Noise	• Additional background noise measurements in Bulga. • Allocation of background noise levels to each individual receiver in Bulga using an advance apportionment technique. • Additional operational control measures following stakeholder engagement resulting in only one property to the north of Bulga triggering acquisition levels. • Full compliance with the Mining SEPP non-discretionary standard in Bulga and surrounds. • Additional commitment to a Bulga and Near Neighbour Amenity Resource.
Air quality	• Additional operational control measures following stakeholder engagement. No properties in Bulga triggering acquisition levels. • Full compliance with the Mining SEPP non-discretionary standard in Bulga and surrounds. • Additional commitment to a Bulga and Near Neighbour Amenity Resource.
Ecology	• Development of a new Biodiversity Offset Strategy (BOS) under the new policy NSW Biodiversity Offsets Policy for Major Projects. • Certification from the Chief Executive of OEH under clause 14(3) of the Mining SEPP that the BOS adequately offsets the impacts of the proposal. • Provision of an additional land based offset known as Hanwood Estate that satisfies the Chief Executive's recommendation for an additional offset. The Hanwood Estate contains Hunter Lowland Redgum Forest in the Sydney Basin Bioregion, Central Hunter Ironbark, Spotted Gum, Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions and the largest subpopulation of the critically endangered plant <i>Persoonia pauciflora</i>.
Cultural heritage	• Inclusion of an additional area within the Wollombi Brook Cultural Heritage Conservation Area.
Historic heritage	• Completion of a detailed Historic Heritage assessment including Great North Road. • Commitment to preparation of Conservation Management Plan for the Great North Road complex, former RAAF Base Bulga complex and the Brick Farm House. • Commitment to establish a MTW Historic Heritage Conservation Fund. • Commitment to establish a Great North Road Conservation Fund.

Aspect	Change
Traffic and transport	• Agreement with Rural Fire Services to establish an emergency access road between Putty Road and the Golden Highway prior to closure of Wallaby Scrub Road.
Final landform	• Filling the Loders Pit final void at MTW with overburden from Warkworth Mine. • A reduction in the final void surface area across MTW from 491ha to 445ha. That is one less void with a reduction in area of approximately 46ha, or 9 per cent, smaller than current approvals. • The proposal allows for an integrated landscape and undulation that is not currently afforded under current approvals.
Social	• A detailed Social Impact Assessment was undertaken in accordance with the Secretary's requirements. • While a number of near neighbours have expressed concerns in respect of the proposal, the objective evidence demonstrates that actual impacts meet prescribed levels in various Government policies. • Additional commitment to develop a Social Impact Management Plan to manage and monitor strategies to reduce social impacts and enhance social opportunities.
Economics	• New models were used to value the external effects associated with the proposal. These included market-based and revealed preference techniques rather than choice modelling of people's preferences. • An assessment of the significance of the resource was undertaken and found to be economically significant, as per the matters outlined in clause 12AA(2) of the Mining SEPP. • NSW Trade and Investment have confirmed the economic significance of the resource.

Appendix 5

Additional information from the Department of Planning and Environment

Mr Paul Forward
Chair - Warkworth & Mt Thorley Reviews
Planning Assessment Commission
GPO Box 3415
Sydney NSW 2001

Dear Mr Forward

**Warkworth & Mt Thorley Continuation Projects
Planning Assessment Commission Review**

I refer to the meeting between the Planning Assessment Commission and the Department on 4 December 2014, where the PAC asked the Department to answer a question that has been raised in many submissions: why is Rio Tinto allowed to seek approval for a proposal that is very similar to the proposal that was refused by the Land and Environment Court in 2013.

The answer is that under the *Environmental Planning and Assessment Act*, applicants have the right to seek approval for any development proposal that is permissible with development consent, and a consent authority is required to follow due process and assess this application on its merits, in accordance with applicable government guidelines and policies.

In other words, a consent authority cannot reject an application purely on the basis of the similarities between it and an earlier proposal, even if that earlier proposal was previously refused by the Court.

In this case it is important to recognise that there are at least three differences between the proposal that was refused by the Court in 2013, and the proposal that is now the subject of this review.

First, there are now two applications for the proposed mining – one for the extension of the Warkworth mine, and one for the continuation of the Mt Thorley operations.

Secondly, there have been a number of changes to the regulatory and policy regime under which the two applications must be assessed that may have a material effect on the consideration of the merits of the applications.

These changes include:

- amendments to the *State Environmental Planning Policy* for mining;
- the adoption of the *NSW Biodiversity Offset Policy for Major Projects*; and
- the publication of the *Voluntary Land Acquisition and Mitigation Policy* for mining projects.

Compliance with the Biodiversity Offset Policy has meant that that the applicant has provided a different offset package to that submitted with the previous application.

Finally, the revised assessment of both of these applications has sought to address some of the key criticisms of the original application made in the Court judgment, particularly in relation to the assessment of the potential noise impacts of the applications.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Marcus Ray', with a stylized flourish at the end.

Marcus Ray
A/Deputy Secretary
Planning Services

17/12/14



MEMORANDUM

WARKWORTH CONTINUATION PROJECT (SSD-6464)

MOUNT THORLEY CONTINUATION PROJECT (SSD-6465)

RESPONSE TO PAC REQUEST FOR INFORMATION

[Note: The PAC's questions are reproduced in bold italics, followed by the Department's responses]

1. Noise

a) Background noise level

Table 8.1 of the Noise and Vibration Study (Appendix F of the Warkworth EIS) provides the Rated Background Level (RBL) for Bulga. The figures in the table were said to be derived from long term background noise monitoring results.

The BMPA questioned why there is a 3dBA difference in the RBL between Locations B and C when they are only 500m apart. Location B is 367 Wambo Road and Location C is 128 Wambo Road.

It is noted that both the Department and the EPA are satisfied with the adopted background noise levels.

The chosen period for assessment for Location B is 07/12/11 to 24/11/12, and 1/1/13 and 31/7/13 for Location C. The question is if the RBL were derived from long term monitoring data, why use a different period for Locations B and C given their proximity to each other. A common period or at least with some overlapping period would give a better picture of the noise environment for the area.

What are the reasons for not using the same period/duration for the RBL calculation? What is the Department's view on the issue?

In regard to the fact that the monitoring periods do not overlap, the Department notes it is common for background data to be monitored 'sequentially' rather than 'simultaneously' for major mining projects. In this case, the background noise monitoring was undertaken at 6 locations and the Department accepts that it would be prohibitively expensive to deploy that many noise loggers over extended periods of time. The Department also notes that there is no justification from a technical or policy perspective to undertake background noise monitoring for major projects all at the same time, particularly where data is available that can be shown to accurately represent background noise levels in the subject area. Rio Tinto has advised that the same monitor was moved from Location B to Location C.

The NSW Industrial Noise Policy (INP) recommends at least 1 week of background monitoring data be used to determine background noise levels. In this case, both locations were monitored over extended periods (between 7.5 and 12.5 months) and both the Department and the EPA are satisfied that the background levels have been derived in accordance with the INP. The Department's independent noise expert (Dr Norm Broner) has also confirmed with the Department that he is satisfied with the adopted background noise levels.

In regard to the difference in the background noise levels, the Department notes that there can be a range of reasons for a difference in the monitoring data. In this case, Location B is approximately 500 metres further away from Mt Thorley which has been the dominant source of mine noise in recent years. There may also be localised differences in topographic shielding and intervening vegetation. This is illustrated in Table 1 which indicates that the difference between the monitoring locations is greatest when Warkworth noise is excluded from the data, particularly during the evening and night-time periods.

Table 1: Representative background noise levels							
Location	Period (Duration)	RBLs (monitoring data)					
		WML Filtered Out *			MTO Filtered Out **		
		Day	Evening	Night	Day	Evening	Night
A. Wollemi Peak Rd	20/06/2013 - 13/08/13	34	33	34	33	33	34
	(2 months)	33.3	32.7	34	33.3	32.7	34.3
B. 367 Wambo Rd	07/12/11 - 24/11/12	30	31	30	30	33	34
	(12.5 months)	29.4	32.8	32.7	29.6	33.0	33.5
C. 128 Wambo Rd	01/01/13 - 31/07/13	33	37	33	33	37	33
	(7.5 months)	33.1	37.1	32.7	33.1	37.1	33.3
D. 193 Inlet Rd	09/12/11 - 27/05/12	30	32	30	30	32	31
	(6 months)	29.8	31.5	30.2	30.0	31.6	30.5
E. 339 Inlet Road	18/03/13 - 30/06/13	30	30	30	30	30	30
	(4 months)	28.1	28.0	23.5	28.2	28.1	25.7
F. Scout Hall (Putty Rd)	07/12/11 - 04/09/12	33	36	35	33	37	36
	(10 months)	33.1	36.2	35.4	32.6	37.3	36.2
*Source: Tables E.1 - E.6, Appendix E of Noise & Vibration Study, Appendix F of Warkworth EIS							
**Source: Tables E.1 - E.6, Appendix E of Noise & Vibration Study, Appendix F of Mt Thorley EIS							

Finally, it is noted that the noise data at Location B would have made an RBL of up to 33 dBA justifiable under the INP for the assessment of the Warkworth extension. However, Rio Tinto has applied an RBL of 30 dBA at the 2 receivers adjacent to this monitoring location (i.e. receivers 29 and 34) for the assessment of both projects, which is a conservative approach and is the lowest allowable RBL under the INP.

In summary, the Department believes there are sound technical reasons for the differences in RBLs applied in the EIS for the Bulga area, and the PAC should have no reason not to accept the RBLs in its consideration of the noise impacts of each of the projects under review.

b) Monitoring of compliance

How confident is the Department in its ability to monitor noise compliance given the difficulty in separating the noise contribution from each mine, particularly in the integrated operation circumstances?

There are numerous cases in NSW where receivers are affected by noise from multiple noise sources (such as Kooragang Island, Port Kembla and mining operations in the Hunter Valley, Leard State Forest region, and Ulan to Wollar region). So the situation encountered at the Mt Thorley and Warkworth mines is not uncommon.

Both mines have operated under separate development consents since they started operating in 1981, and over the last thirty years the companies have had to conduct separate noise compliance monitoring, and have been able to do this effectively.

In NSW, only attended monitoring can be used to monitor compliance with noise limits under planning approvals and environmental protection licences. This involves the person carrying out the monitoring to distinguish between the various sources of noise at any one location, and exclude extraneous noise sources from the monitoring results.

With large mining operations spread over several kilometres, such as the Warkworth and Mt Thorley mines, it can be relatively simple to determine the relative contribution of each mine, particularly when the receiver is close to one mine and a long way from the other. An example of this is the receivers in the Warkworth Village, which are several kilometres away from the Mt Thorley mine. However, this can become more challenging when the receivers are in close proximity to the boundaries of both mines. Nevertheless, it is technically feasible and has been done effectively by noise experts for many years now.

Because “real time” or directional monitors (such as BarnOwls) cannot exclude noise from extraneous sources, they are not suitable for compliance monitoring and are used exclusively for reactive noise management at mines.

The distinction between the two types of noise monitoring carried out at mines, and the purpose for which each is carried out, is not well understood within the broader community, and commonly leads to confusion, particularly when people try to judge the compliance of mines by interpreting the real time noise monitoring results.

In recent consents, the Department has required mining companies to try and improve the calibration between attended and real time monitoring results, so the real time monitoring results can become a better indicator of compliance and trigger further attended monitoring.

However, this work is still in its infancy and could take several years before it can be used effectively.

The following table shows several examples of the applicable noise criteria (PSNL day) for Warkworth and Mt Thorley on the same property.

Property No.	Warkworth Noise Criteria	Mt Thorley Noise Criteria	2012 approval
12 (Bulga)	38dBA	36dBA	38dBA (assuming it falls within the other residences category)
34 (Bulga)	Acquisition	NA	Mitigation
126 & 262 (Gouldsville, Long Point)	41dBA	38dBA	38dBA (assuming it falls within the other residences category)
148 (Mt Thorley)	36dBA	39dBA	Acquisition

It is important to distinguish between RBLs, PSNLs and the predicted impacts at receivers. Rio Tinto has adopted the same RBLs and PSNLs for all receivers for both projects (refer to Table D1, Appendix D of Appendix F of both the Warkworth and Mt Thorley EISs). However, as separate noise modelling has been undertaken for each project, the noise impacts at each receiver will be different.

The noise criteria recommended by the Department in the draft conditions reflect the model predictions, which in many cases are above the PSNLs.

As the 2012 approval considered the Warkworth and Mt Thorley mines as a single complex, these criteria are not relevant to the consideration of the current applications.

Property 34 is on the list of acquisition in the draft conditions for the Warkworth project, but not identified with any noise criteria in the Mt Thorley project unless it falls within the “all other residences” category, in that case, the PSNL will be 35dBA. It was on the mitigation list of the 2012 approval conditions.

The noise assessment in the Mt Thorley EIS provides a PSNL of 35 dBA for Property 34. However, it appears that this property has been omitted from the site-specific noise predictions.

Interpolation from nearby properties suggests that a noise criterion of 37 dBA should be applied to this property (i.e. 2 dBA above the PSNL). Under the *Voluntary Land Acquisition and Mitigation Policy* such an exceedance would be considered ‘negligible’ and the landowner would not be entitled to mitigation.

While the Department would be prepared to set the noise limits of 37 dBA for this property, the draft conditions currently set the noise limits at 35dBA.

The Department has sought site-specific noise predictions for this property from Rio Tinto, and may well revise the noise criteria in any final conditions for the Mt Thorley project.

The Warkworth PSNL for Property 148 is 36dBA and 39dBA for the Mt Thorley project. But it was on the acquisition list of the 2012 approval. It is easy to understand the frustration and confusion this has created within the community.

It is important to note that in the 2012 Preferred Project Report, noise was predicted to be 2 dB above the PSNLs at Property 148. Such an exceedance is considered negligible and would not normally warrant the provision of acquisition rights.

Acquisition rights were granted to Property 148 (DC Russell) under the 2012 approval simply because this property had had acquisition rights under the Mt Thorley consent for many years, and consistent with the complex-wide approach adopted for the assessment in 2012, the Department wanted to ensure noise conditions were consistent across both mines.

The noise criteria recommended by the Department are based on a fresh assessment of the potential impacts of each of the mines in accordance with the revised modelling. This modelling has been calibrated with up-to-date noise monitoring data, and incorporates additional mitigation measures implemented since 2012 (e.g. attenuation of some of the mining fleet). As a result, the predicted impacts are considered to be more accurate than previous predictions, and in many cases, less than what was predicted in previous assessments.

Finally, the Department notes that in applying the *Voluntary Land Acquisition and Mitigation Policy*, Property 148 would be entitled to additional noise mitigation at the residence, but not acquisition. The Department's recommended conditions reflect the NSW Government policy in this regard.

Another example is the PSNL for the two current projects for property 148 has a difference of 3dBA. Please explain how monitoring of compliance is to be carried out in relation to this property? How confident is the Department that it can accurately identify and differentiate the source of noise from Warkworth or Mt Thorley given the integrated operation of the two mines?

As described above, the Department notes that it is technically feasible to differentiate the noise from the adjacent mines in most situations.

c) *Attenuation Program and Current/Proposed Mitigation Measures*

- Currently only 50% of haul truck fleet has been attenuated. The rest is expected to be attenuated by the end of 2016. Attenuation program for the mining fleet of dozers, excavators and drills will continue are expected to be attenuated by the end of 2016.***

Need to accelerate the attenuation program to reduce noise? The benefits of accelerating the attenuation program v the cost?

Rio Tinto has provided additional information to justify why it is not reasonable and feasible to accelerate the proposed attenuation program of its mining fleet (see Appendix A).

In summary, Rio Tinto has advised that there are 53 trucks, 10 dozers, 2 excavators and 4 drill rigs that still need to be attenuated. On average fitting the attenuation kits takes between 2 and 4 weeks. Even with the use of off-site facilities, it is not possible to complete the attenuation program before the end of 2016 without significant production losses at the mine.

The Department accepts this argument.

However, the Department notes that the attenuation program would be progressive, the loudest trucks would be prioritised, and attenuated fleet would be deployed on the most exposed areas of the site.

The Department also notes that fitting attenuation to a typical haul truck would reduce the sound power levels from around 125 to 115 dB. While such a reduction is intuitively large, the difference of an individual truck would be negligible within the context of such a large mining fleet.

Given that around 27 out of 80 trucks (33%) have already been attenuated, a significant proportion of the acoustic benefits have already been realised. This is reflected in the lower noise predictions at many residences compared with the predicted impacts in the 2012 EIS. Attenuation to the remaining trucks in the fleet will result in further incremental improvements in mine generated noise, but will be increasingly minor in the context of the overall noise catchment. Even when the attenuation program is complete across the entire fleet, the predicted noise benefit at receivers in the Bulga area would be no more than 2 dBA – a difference that is usually imperceptible.

Given that the current attenuation program would cost in excess of \$30 million, and the acoustic benefits of accelerating the program would be limited, the Department considers that the costs of accelerating the attenuation program far outweigh any benefits that may be realised. It is also important to note that the Department has recommended stricter noise limits once the attenuation program is complete (i.e. from January 2017).

- **Any additional mitigation measures could be imposed to further reduce the noise impacts?**

The Warkworth EIS includes detailed consideration of various options to further reduce noise (see pages 224-225 Appendix F). The Department's assessment report also includes consideration of additional mitigation measures in accordance with the requirements of the INP (see page 32-33 of the Warkworth Secretary's Assessment Report).

An excerpt of the key section in the EIS is reproduced below.

The mine plans that form the basis of the assessment were optimised over many iterations of noise modelling for different operating scenarios. In arriving at the mine plans, alternative noise minimisation techniques were identified and applied. Some potential options, however, were rejected for a number of reasons. For example, reducing the height of night time overburden emplacement activities and acoustically treating the CPP were considered but found to provide minimal acoustic benefit (less than 1 dB(A)).

Noise mitigation along the transmission path such as a large noise bund was also considered and was found to be ineffective for the assessment locations in Bulga. The slope of the terrain between the mine and Wollemi Brook to the west would require a bund to be considerable in extent and height and would only provide minimal noise benefit to Bulga residences. Notwithstanding, if line of sight to residences could be obstructed, the benefit would be marginal during adverse weather conditions when it would be needed most. The impractical nature of such a bund includes the need for considerable land area to accommodate the bund's base and would need to be adjacent the Wollombi Brook in the proposed offset areas so as not to sterilise coal resources (see Chapter 23 of EIS).

Further plant relocation to in-pit areas or plant shutdowns to achieve PSNL at all assessment locations in Bulga (ie beyond those described previously) were also considered in the modelling and assessment process. However, these were found not to be reasonable for the Site. For example, the scenario required to achieve PSNL at all assessment locations in Bulga village resulted in one excavator, one dragline, 12 haul trucks, 12 dozers and two drills being relocated or shut down during adverse meteorological conditions. The resultant loss in production from this quantity of plant being disengaged, for the frequency and duration required due to the presence of adverse meteorological conditions, exceeds \$100 million (real NPV) over the life of the proposal.

Ultimately, the only options that would appreciably reduce the predicted noise impacts of the mine would be to shut down a significant proportion of the plant during adverse meteorological conditions and/or avoid operating the mine at night. However, these options would come at a significant cost.

The question is therefore not whether it is feasible to reduce the noise impacts of the projects, but whether it is reasonable to do so.

In this context, the Department considers that determining if something is 'reasonable' relates to the application of judgement taking into account the cost of mitigation versus the benefits provided.

As outlined above, noise modelling indicates that compliance with the PSNLs would result in at least \$100 million in lost production over the life of the mine. While the Department does not have any specific information, it would be reasonable to assume that a reduction in the NPV for the project on this scale would have implications for the economic viability of the mine as a whole, and at a minimum, result in significant job losses at the mine. Furthermore, routinely standing down equipment would slow the progress of the mine considerably, and is likely to increase the life of the mine (and associated impacts) by several years.

In terms of benefits, it is important to note the difference between intrusive criteria and amenity criteria under the INP. The INP indicates that both criteria must be taken into account when assessing the noise impact of industrial noise sources. The application of intrusive criteria in development assessment aims to result in these criteria being met for at least 90% of the time periods over which annoyance reactions can occur. The amenity criteria are designed to set the maximum acceptable noise levels for different land use categories.

In analysing the predicted noise impacts, the vast majority (81 out of 118) of exceedances are less than 2 dB over the intrusive noise criteria (i.e. PSNLs). Under the *Voluntary Land Acquisition and Mitigation Policy*, such as exceedance is considered to be 'negligible' and does not warrant additional noise mitigation. The Department's independent noise expert indicates that exceedances of up to 2 dB would not be perceptible to affected residents.

There are 17 properties where 'moderate' exceedances are predicted, and the Department has recommended that these residences be entitled to additional mitigation. There are also 2 properties where significant noise exceedances are predicted and the Department has recommended these landowners be afforded acquisition rights.

In considering the operational noise impacts on privately-owned properties, there are three further points that are important.

First, the predictions are based on the change in noise levels relative to background noise levels that have not existed for many years, as the Warkworth mine has been part of the noise landscape for over 30 years now.

Second, these predictions are worst case predictions under adverse weather conditions occurring in the most affected season in the most affected year, so actual impacts are likely to be lower than predicted.

Finally, despite the predicted exceedances of intrusive noise criteria, cumulative noise levels (which includes the project and all other industrial sources such as the Bulga mine) would remain below the recommended maximum amenity criteria for a rural area in the INP at all privately-owned residences surrounding the mine that do not have existing acquisition rights, and therefore below the non-discretionary standards in the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP).

In summary, the Department considers its recommendations are consistent with both the *Voluntary Land Acquisition and Mitigation Policy* and the INP. The Department also considers that any acoustic benefits of modifying operations to meet PSNLs are far outweighed by their costs, and based on current government policy, cannot be justified.

- ***What's the attenuation effect of Saddleback Ridge – 1-2dBA in the RTS or up to 5DBA in the LEC Judgement?***

The attenuation effect of Saddleback Ridge depends on the meteorological conditions.

Advice from the Department's independent noise expert indicates that under neutral meteorological conditions Saddleback Ridge may reduce noise levels at receivers in Bulga by up to 5 dBA. However, under these conditions the noise from the mine is predicted to comfortably comply with the PSNLs.

Under noise-enhancing meteorological conditions, the shielding provided by Saddleback Ridge would be significantly diminished. Dr Broner advises that the attenuation benefits at receivers in Bulga would be between 1 and 2 dBA.

- ***Any comments on the claim of insufficient monitoring stations and the poor quality of monitoring results?***

Presumably this refers to the quality of data used to support the assessment of the current applications. In this regard, the EPA has advised that the monitoring data used in the noise assessment significantly exceeds that required under the INP. Dr Broner has advised the Department as follows:

The Author is satisfied that the significant amount of background noise level data collected in and around Bulga adequately portrays the range of background noise levels experienced in the area. The data sets employed used at a minimum, many months of data (3 – 11 months depending on location) and also considered seasonal variations and wind directions...Section 3.5 of the INP requires only "Typically, one week's worth of valid data covering the days and times of operation". The data set for the Bulga area is thus very comprehensive.

If this refers to the existing noise monitoring program, Dr Broner has advised:

The current noise emission level management process appears robust and effective. Five Barn Owl loggers are deployed in and around Bulga with thresholds set to trigger before the criteria are exceeded. Thresholds are set to trigger 2 dBA below the criterion for the given location (and also another trigger is set at the criterion level) and when a threshold is activated, the pro-active noise management team dispatch a Community Assessment Officer to the location to assess what the noise sources are that maybe an issue. The Community Assessment Officer then reports back to the night operations team who then take immediate control actions in terms of modifying operational equipment based on previous protocols to so as to minimise noise emission (if required, the same response approach occurs 24/7). In general, a Community Assessment Officer is in the area every night from around 7 – 8 PM and, depending on weather conditions, may be in the area until 5 – 6 AM. They can and do advise operations if they notice anything which requires attention at any time. The MTW also currently uses a predictive approach to the weather on a daily basis and then decide how to organise the operations accordingly. This is to ensure smooth operations even under adverse propagation conditions and shows a further pro-active approach to noise management. This approach is appropriate and consistent with current world's best practice.

d) Low Frequency Noise Level

- ***The SKM April 2012 report "found that low frequency noise impacts were considered to be significant at two locations, and moderate at two further locations." What action, if any, has been taken to address the issue?***

The Warkworth Noise and Vibration Study table 10.12 provides a review of LFN monitoring data for 2013. The table indicates exceedence in 5 locations when applying the INP criteria and 3 locations when applying the Broner criteria.

The Department agrees that low frequency noise (LFN) was considered in the SKM report to be significant at two locations and moderate at two locations. However, it is important to note that SKM concluded that the LFN did not result in any non-compliances with the applicable criteria.

The Department notes that LFN is often misunderstood and applied in circumstances that are not consistent with the INP.

This is explained further by Dr Broner below:

To establish a low frequency (LFN) problem, the INP, in Section 4.1, specifically states in the first paragraph "This section outlines the correction factors to be applied to the source noise level at the receiver before comparison with the criteria specified in Section 2 to account for the additional annoyance caused by these modifying factors". So, very importantly, the penalty does not apply to general noise. It must be applied specifically to the noise source in question, in this case Warkworth or Mt Thorley separately.

In relation to the results of the independent noise monitoring conducted by SKM in 2012, it is noted that SKM conducted long term noise level measurements over two months at 8 selected residential locations in the Bulga community and found that the in C – A weighted difference in noise levels exceeded the 15 dB application value for 15 to 45% of night time measurements depending on the measurement location.

On the surface, this suggests a significant exceedance in many cases at night over the monitoring period. However, to determine this, SKM have simply used the overall measured values rather than checking the (C – A) level difference based on the Warkworth or Mt Thorley mine noise itself. It is very important to note that this penalty is to be applied only to the noise due to the noise source under investigation and is not meant to be based on a comparison of the overall total measured noise levels. Not calculating the difference appropriately will give misleading results.

In Volume 1 of the Warkworth Continuation 2014 – Response to Submissions, an assessment of the (C – A) difference for mine noise was modelled for various locations in Bulga for Year 9 worst case scenario. None of the differences exceeded 15 dB. This scenario is the worst case scenario across all years and therefore sets the upper bound of expected noise levels from Warkworth mine.

The EPA in its August 2014 submission to the Department advised that it proposes to apply the methodology for LFN in Table 4.1 of the INP unless further information is provided.

The RTS in section 4.3.1.i confirms that the predicted Leq_{dB}C minus Leq_{dB}A are less than 15dB and, therefore, the INP penalty is not expected to apply during times when mine noise is predicted to be at its highest.

How confident is the Department in the RTS assessment/conclusion when the SKM and the proponent's 2013 monitoring results both indicated exceedances.

The Department understands that the EPA would not automatically apply a 5 dB penalty based on the methodology currently in the INP as it is recognised that this regularly results in false positives.

As a result of contemporary research into LFN, the Department understands that the EPA would only use the C – A method as a screening tool to trigger further investigation of LFN impacts based on those contemporary studies. The Department agrees with this approach.

Furthermore, a review of the INP has been undertaken and is currently with the EPA for internal review prior to any public exhibition. The review considered contemporary assessment of LFN as well as the limitations of the current method of assessment in the INP. Whilst the EPA is best positioned to advise the PAC about the proposed methods for assessing LFN, the Department understands that none of the proposed approaches for assessing LFN would include a mandatory penalty calculated on the basis of C – A weightings.

Based on the assessment in the EIS and RTS, the Department is confident that mining noise experienced at Bulga does not contain excessive levels of LFN. This is supported by the noise signature of the mine which does not indicate any potential for exceedances of contemporary limits regarding LFN (see advice of Dr Broner below).

- **The INP criteria v Broner criteria**

The Broner method of LFN assessment is far superior to the current INP criteria as it does not suffer from differential attenuation over distance. However, it is likely that the Broner method can also be refined so that it better covers specific noise spectrums and mine noise signatures as discussed in the advice from Dr Broner below:

The EPA has acknowledged that a test of $C - A > 15$ dB for the LFN penalty to be applied breaks down at larger distances from noise sources due to the natural attenuation difference between high and low frequencies leading to a very unbalanced spectrum at larger distances which by default leads to $(C - A)$ differences greater than 15 dB even though the sound levels at those larger distances are relatively low and would not cause any annoyance.

The $C - A > 15$ dB test was originally developed for assessing noise sources close to the source, not for circumstances where sources are at a kilometre or more away. Note also that localised winds can also cause the $(C - A)$ difference to exceed 15 dB due to the LFN content of wind noise so that a failure of the test could also occur at larger distances solely due to wind.

Dr Broner developed the simplified approach using overall C weighted noise levels for assessment, particularly for power stations and other noise sources with a significant low frequency noise imbalance at larger distances and for which the INP approach had significant limitations. Dr Broner believes that these limits could also apply for mine noise though it is possible that the limits could be relaxed for mine noise by say 5 dBC.

In the 2012 SKM report on the monitoring results, SKM also looked at compliance with the Broner overall C – weighted criteria. These results showed, that if the assumption is made that the C weighted level was solely due to the mines, then the desirable criterion was exceeded at night during only 1 – 6 % of the times with one location up to 29%. But the maximum Broner criterion of 65 dBC was exceeded only 0 – 1% of the time with the highest being 4% of the time. And these results were based on a measurement of all noise, not noise solely due to the noise source.

Based on observations on site, this is a more realistic upper bound of the real LFN problem. In practice, given the distance of the residences from the mines, when the mine noise is audible (excluding any truck exhausts and track slap which have a tonality and which are being addressed), it is audible as a continuum which is not particularly attention getting. This is especially so when wildlife and other background noises are present and which seem to be quite common in the area.

Given the above, I am very confident in the RTS assessment and conclusion.

e) Acquisition

- ***The proponent in its RTS committed to honouring the voluntary acquisition rights granted to some residents under the now rescinded approval for the Warkworth Extension Project 2010. These rights were lost when the LEC overturned the PAC approval in 2013. What's the Department's view on this commitment, and the best way to formalise this commitment?***

The allocation of voluntary acquisition rights in conditions should be done in accordance with the government's *Voluntary Land Acquisition and Mitigation Policy*. This policy identifies the circumstances in which voluntary acquisition rights should be granted, the terms of any acquisition, and provides for dispute resolution in circumstances where there is disagreement about the value that should be paid for properties.

While the RTS includes details of Rio Tinto's commitment to honour the voluntary acquisition rights granted under the approval for the Warkworth Extension Project that was overturned by the NSW Land & Environment Court in 2013, there are a number of uncertainties about the commitment.

First, while the commitment in the RTS is discussed in the body of the document, it is not repeated in the formal statement of commitments in Appendix M of the RTS.

Second, the terms of acquisition are not clear. Commonly, such acquisition would be based solely on the market value of the property, and not market value plus “disturbance” which are the terms used under the *Voluntary Land Acquisition and Mitigation Policy* and formal conditions of consent. The difference is usually intentional, and is an acknowledgement of the difference in the significance of the impacts between those properties that are in the formal acquisition zone and those that sit outside this zone. Mining companies have regularly used such commitments in NSW to enable landowners to move away from areas that are close to mines even though the noise impacts are not predicted to be significant. Such commitments are considered to be a “social contract” between the mine and the relevant landowners rather than a regulatory obligation.

Finally, the commitment does not spell out a formal process for resolving disputes during any acquisition process. This is presumably because the transaction is considered to be a private matter between the parties, rather than a regulatory matter that can be enforced by a consent authority.

While Rio Tinto's commitment could be reflected in any conditions of consent, as a statement of commitment for instance, the Department believes the merits of this should be considered carefully; and if it is done then these acquisition rights should be clearly distinguished from any acquisition rights that are granted under the government's *Voluntary Land Acquisition and Mitigation Policy*.

- ***Should this commitment be extended to the rights to mitigation measures included in the PAC 2012 determination? If not, why not?***

The allocation of mitigation rights in conditions should be done in accordance with the government's *Voluntary Land Acquisition and Mitigation Policy*, and based on the predicted impacts of the projects currently under assessment, not those of a previous project that was refused.

The Department notes that Rio Tinto has not made any commitment to provide mitigation measures to properties over and above those that would be entitled to mitigation under the government's *Voluntary Land Acquisition and Mitigation Policy*.

2. Biodiversity and Rehabilitation

- a) ***The BMPA contended that if the current applications are new applications as claimed, the 2010 EPBC approval is not applicable to the current applications and new EPBC approval is required.***

The proponent in its RTS claimed that the EPBC approval 2009/5081 was granted for the Warkworth Extension 2010 and its predicted impacts on listed threatened species and communities and listed migratory species for the proposed disturbance areas. The current applications propose the same disturbance area and the 2010 project and will not result in any additional disturbance to that contained in the EPBC approval 2009/5081 or any new or increased impacts to matters of NES or other protected matters.

What is the Department's view on whether a new EPBC approval is required?

This is essentially a matter for the Commonwealth.

The Commonwealth approval under the EPBC Act for the proposed expansion of the Warkworth project, or the ‘activity’, has not been challenged and remains valid.

The Department notes the spatial extent of the current Warkworth project is generally consistent with the ‘activity’ that was approved by the Commonwealth.

- b) ***The proposed offsets are different from the previous application. Does this affect the EPBC approval or the test is that the affected site area is the same as stated in the EIS/RTS.***

The simple answer is no.

While there is often significant overlap between State and Commonwealth offsets for the same project, there are also often divergences between the two because the Commonwealth matters normally only cover a subset of the State's matters.

As indicated above, Rio Tinto is obliged to provide offsets under its existing Commonwealth approval.

For the PAC's information, the Department understands that there are two EPBC Act approvals in place (EPBC 2002/629 and EPBC 2009/5081).

EPBC 2002/629 was approved in February 2004 for the 2003 extension. It was varied in July 2012 to replace the 2003 offsets with the Goulburn River and Seven Oaks Biodiversity Management Areas. The Seven Oaks Biodiversity Management Area was substituted with the Bowditch Biodiversity Management Area by variation in December 2013. A further variation was granted in August 2014 to provide more time to secure a legally binding mechanism over the offsets.

EPBC 2009/5081 was approved in August 2012 for the 2012 Warkworth Extension Project and included the Bowditch, Putty and Southern Biodiversity Management Areas. As a consequence of the disapproval of 2012 extension in NSW, EPBC 2009/5081 was varied in December 2013 to replace the original offsets with a Phase 1 and Phase 2 offset approach. The Phase 1 offset includes the Putty Road offset area (the same area required under Mod 6) and the Phase 2 offsets are required prior to commencing the action (i.e. beyond Mod 6).

Regardless, of these approvals, the Department is required to consider the merits of the current Warkworth and Mt Thorley applications in accordance with existing Government policy.

c) *The offset package puts substantial reliance on mine rehabilitation. However, the evidence (current rehabilitation on site) does not appear to indicate good progressive rehabilitation. What are the current conditions of approval regarding rehabilitation and how can it be improved to ensure future rehabilitation will be undertaken in a timely manner and meet the objectives?*

There are two key concepts in this question: the ability to use mine rehabilitation to offset biodiversity impacts; and the status and quality of the progressive mine rehabilitation at the two mines.

In relation to the first issue, government policy now supports the use of mine rehabilitation for offsets.

This is partially to create an incentive for good quality rehabilitation, but also because mine rehabilitation has the potential to make a significant contribution to biodiversity conservation values of regions in the medium to long term, particularly in areas such as the Hunter Valley where the valley floor has been largely cleared over the last 100 years for a range of development.

In acknowledgment of the risks involved, calculators include discounting factors of 50% for rehabilitated land.

Further, under the draft conditions Rio Tinto will be required to retire the ecosystem credits that are allocated to mine rehabilitation within 10 years of the completion of mining operations.

If the rehabilitation does not meet the completion criteria, Rio Tinto would be required to retire the relevant credits using another method.

If the rehabilitation is better than expected (i.e. worth more than the 50% allocated under the calculator), then Rio Tinto would be able to use any excess credits generated to offset the impacts of other projects in the region.

Both the Department and OEH consider this to be a robust regime for implementing the government's policy.

In relation to the second issue, until recently progressive rehabilitation has been hampered at the mines by a number of legacy issues, but principally by the fact that the mines were operating in a number of different pits. This reduced the amount of land available for progressive rehabilitation.

These constraints have now been removed to a large extent by the progress of mining operations, and over the last year or so there has been a significant improvement in both the speed and quality of progressive rehabilitation at the Warkworth mine.

In January 2014, the Department updated the rehabilitation conditions under the 2003 Warkworth development consent following a modification application (MOD 6). The conditions now reflect contemporary standards for the regulation of rehabilitation, including conditions that require Rio Tinto to:

- comply with a range of rehabilitation objectives;
- progressively rehabilitate the site;
- prepare and implement an accelerated rehabilitation program for the South Pit Area (which is now underway); and
- prepare and implement a comprehensive Rehabilitation Management Plan.

Similar conditions have been included in the recommended conditions for the Warkworth and Mt Thorley Continuation Projects.

The implementation of the accelerated rehabilitation program is being monitored by the Department and the Division of Resources and Energy (DRE). Both agencies are satisfied that the progress of rehabilitation on the site is now generally consistent with the various obligations under applicable regulatory instruments, including the Mining Operations Plan recently approved by DRE.

However, the Department acknowledges there may be opportunities to strengthen the conditions by carrying through the accelerated rehabilitation program to apply to the entire site. This would emphasise the importance placed on successful progressive rehabilitation by regulators and create clear milestones that would have to be achieved as the mine progresses. The applicable condition in the current Warkworth consent is reproduced for reference below.

Progressive Rehabilitation

The Applicant shall prepare and implement an accelerated progressive rehabilitation program for the South Pit Area of the site. This program must:

- (a) be prepared in consultation with the Executive Director Mineral Resources;
- (b) be submitted to the Director-General for approval by 30 June 2014, unless the Director-General agrees otherwise;
- (c) describe the measures to be undertaken to implement the program;
- (d) include performance and completion criteria for evaluating the performance of the accelerated progressive rehabilitation measures;
- (e) include a timetable for the implementation of the program, including any amendments required to the MOP; and
- (f) include a program to monitor, independently audit and report on the effectiveness of the accelerated progressive rehabilitation measures and progress against the performance and completion criteria.

d) Are areas of WSW identified in SBA and NBA consistent with findings of the L&E Court judgement?

Warkworth has adopted the extant areas of Warkworth Sands Woodland consistent with the findings of the Land & Environment Court judgment (i.e. 464.8 hectares) (refer to Section 12.3.2(i)(a) of the EIS and paragraph 98 of the LEC judgment).

e) The likelihood that the Warkworth Sands Woodlands can be successfully re-established?

Based on its discussions with OEH, and the ecological reports in the EIS and Response to Submissions, the Department understands that Warkworth Sands Woodland has a high likelihood of being able to be successfully re-established.

This is evidenced by:

- anecdotal evidence of natural Warkworth Sands Woodland regeneration to good condition on the site itself (refer to historical aerial photography – Figure 2.12 in the Response to Submissions);
- the suitability of the Warkworth Sands Grassland soils as suitable substrate for re-establishment;
- the building scientific basis for re-establishment, particularly the ongoing work by UNE; and
- the fact that Warkworth Sands Woodland comprises relatively common species (ie. the species themselves are not threatened).

The Department has recommended conditions to ensure that the likely success of Warkworth Sands Woodland re-establishment is maximised, including requirements to:

- develop suitable performance criteria for the regeneration to the satisfaction of OEH;
- lodge a large (\$1 million) bond for these works; and
- develop an Integrated Management Plan to coordinate management and recovery efforts for Warkworth Sands Woodland.

In addition, as outlined in the recent response from Rio Tinto (see Appendix A), an additional land-based offset has been identified. OEH has indicated that this land would comprise ecological values that are equal to or greater than the 72 hectares of Warkworth Sands Woodland that would be disturbed by the Warkworth Continuation Project.

f) Please provide a clear table which explains required and proposed offsets as well as the 2003 approval and proposed changes (including previously identified NDA).

Required Offsets

Warkworth must retire a total of 68,990 biodiversity credits to offset the clearance of:

- 611 ha of vegetation and 624 ha of species habitat within the 2014 disturbance area; and
- 478 ha of vegetation and 334 ha of species habitat cleared under the 2003 consent.

These offsetting requirements are outlined in Table 2.

Table 2: Vegetation and Habitat Disturbance Areas and Corresponding Biodiversity Credit Value

Vegetation Cleared	Area (Hectares)				Credit Value			
	2014 Non-WSW	2014 WSW	2003 Non-WSW	Total	2014 Non-WSW	2014 WSW	2003 Non-	Total
Warkworth Sand Woodland	0	72	0	72	0	3043	0	3043
Warkworth Sands Woodland Derived Native Grassland	0	1	0	1	0	16	0	16
Central Hunter Grey Box - Ironbark Woodland (EEC)	366	0	249	615	14192	0	9192	23384
Central Hunter Grey Box - Ironbark Woodland - Regenerating (EEC)	6	0	0	6	108	0	0	108
Central Hunter Grey Box - Ironbark Derived Grassland	152	0	227	379	1773	0	2743	4516
Central Hunter Ironbark - Spotted Gum - Grey Box Forest (EEC)	15	0	2	17	576	0	57	633
<i>Sub-total</i>	539	73	478	1090	16649	3059	11992	31700
Species Impacted								
Regent Honeyeater	86	373	251	710	1923	10323	6683	18929
Southern Myotis	12	153	72	237	875	11809	5538	18222
Large-eared Pied Bat	0	0	11	11	0	0	139	139
<i>Sub-total</i>	98	526	334	958	2798	22132	12360	37290
Total	637	599	812	2048	19447	25191	24352	68990

Proposed Offsets

Warkworth proposes to retire 26,584 biodiversity credits through land-based offsets under the BioBanking Scheme in the *Threatened Species Conservation Act 1995*, as well as mine site rehabilitation (see Table 3). This includes:

- 4,089 credits retired within the Northern Biodiversity Area;
- 11,291 credits retired within the Southern Biodiversity Area; and
- 11,204 credits retired through mine rehabilitation (credits discounted at 50%).

To retire the remaining 42,406 biodiversity credits, Warkworth proposes to:

- secure additional land based offsets within the Goulburn River and Bowditch properties;
- make payments into the Upper Hunter Strategic Assessment offset fund; and
- provide a range of supplementary measures (for the clearance of the Warkworth Sands Woodland), including:
 - o an Integrated Management Plan;
 - o establish completion criteria for the re-establishment/management of Warkworth Sands Woodland (tied to a \$1 million bond);
 - o contribute \$1 million to the *Save Our Species – Regent Honey Eater* program; and
 - o secure and manage an additional 72 ha land based offset of equal or greater value than the 72 ha of Warkworth Sands Woodland proposed to be cleared (a potentially suitable property has since been identified by Rio Tinto and accepted by OEH).

Table 3: Biodiversity Credit Value – Disturbance Areas vs. Proposed Offset Areas

Vegetation/Species Type	Disturbance		Offset Areas *		Residual Credits to Retire
	Area (Ha)	Credit Value	Area (Ha)	Credit Value	
Warkworth Sands Woodland	72.12	3043	75.65	593	2450
Warkworth Sands Woodland Derived Grasslands	0.67	16	159.18	1731	-1715
<i>sub-total</i>	72.79	3059	234.83	2324	735
Central Hunter Grey Box - Ironbark Woodland (EEC)	614.64	23384	503.06	4839	18545
Central Hunter Grey Box – Ironbark Woodland Derived Grassland	378.60	4516	167.25	1545	2971
Central Hunter Grey Box – Ironbark Woodland – restored farmland / regenerating	6.43	108	72.07	496	-388
Central Hunter Grey Box – Ironbark Woodland – post-mine rehabilitation	0	0	2100	11204	-11204
Central Hunter Ironbark - Spotted Gum - Grey Box Forest (EEC)	16.61	633	0	0	633
Hunter Lowlands Redgum Forest	0	0	32.48	332	-332
White Box Woodland	0	0	28	313	-313
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	0	0	42.05	425	-425
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley - Regeneration	0	0	0.73	6	-6
Native Olive – Rusty Fig semi-evergreen vine thicket of the upper Hunter Valley, Sydney basin Bioregion	0	0	1.01	11	-11
<i>sub-total</i>	1016.28	28641	2946.65	19171	9470
Total	1089.07	31700	3181.48	21495	10205
Regent Honey Eater Habitat	710	18929	685.86	4116	14813
Southern Myotis Habitat	237	18222	162.18	973	17249
Large-eared Pied Bat	11	139	0	0	139
<i>sub-total</i>	958.0	37290	848.04	5089	32201
Total	2047.07	68990	4029.52	26584	42406

* Northern and Southern Biodiversity Offset Areas, and mine rehabilitation

2003 Approval

The 2003 approval required Warkworth to implement the Biodiversity Offset Strategy shown below (*Table 1 of Condition 1 of Schedule 4 of DA-300-9-2002-i*):

Parameter	NDA	HMA	On-site	Putty Road Offset Area
Woodland	300ha	453ha	676ha	94ha
Open Woodland	317ha	412.3ha	510.5ha	-
Native Pasture	23.6ha	-	1143.5ha	-
Cleared Land	86.3ha	23.4ha	-	-

The 2014 disturbance area would mine through part of NDA1 and HMA1 (see Figure 2.5 of the EIS).

The majority of the 2003 offset requirements would continue to apply under the Department's recommended conditions, including:

- part of the HMAs and NDAs, which would be transferred to the Southern Biodiversity Offset Area;
- 159.8 ha of Warkworth Sands Woodland dedicated as offsets under the 2003 consent (see Figure 12.7 of the Warkworth EIS); and
- the 94 ha Putty Road offset.

The only exception to this is the parts of the HMAs and NDAs between the proposed extension area and the Southern Biodiversity Offset Area. If the current application is approved, any protection under the 2003 consent and the associated Deed of Agreement would cease to apply. This is because the offsetting liabilities attached to this land would be replaced with the new biodiversity offset strategy which incorporates the impacts associated with the 2003 extension.

In other words, the proposed biodiversity offset strategy fully compensates for the impacts of the 2003 extension and the proposed 2014 extension in accordance with contemporary BioBanking Assessment Methodology (BBAM) and the BioBanking Certification Assessment Methodology (BCAM) as modified by the Upper Hunter Strategic Assessment. The biodiversity offset strategy has also been certified as adequate in accordance with Clause 14(3) of the Mining SEPP, including the latest property identified by Rio Tinto to provide an additional offset for the clearing of 72 ha of Warkworth Sands Woodland.

3. Air Quality

a) Modelling includes reduction in emissions as a result of cessation of mining on other nearby sites under current approvals over time. Should cumulative impact be considered if these mines gain approval to continue? Is this likely?

Any subsequent application to continue or extend operations at another mine in the area would be required to include appropriate cumulative impact assessments.

That is, each successive application is required to include cumulative impact assessments that consider all existing and approved mining operations (and other emission sources).

Consequently, the Department does not believe it would be appropriate or even legally valid to consider cumulative impacts associated with a potential future expansion or continuation of another mine under the current application/s.

b) Cumulative 24 hour PM₁₀ dust impacts have not been adequately considered. Additional information is required to determine acquisition requirement.

The *Voluntary Land Acquisition and Mitigation Policy*, as gazetted on 19 December 2014, provides that a consent authority should only apply voluntary acquisition rights for 24-hour PM₁₀ where levels exceed 50µg/m³, based on incremental impact (ie. increase in concentrations due to the development alone), with up to 5 allowable exceedances of the criteria over the life of the development. The criterion applies at residences, some workplaces and where more than 25% of any privately-owned land is affected.

The EIS for the Warkworth Continuation Project indicates that two residences would exceed this criterion – Property 77 and Property 264. No residences are predicted to experience exceedances of this criterion due to the Mt Thorley Continuation Project.

When the Department prepared its assessment report, Rio Tinto had not assessed the potential impact of 24-hour PM₁₀ dust concentrations for vacant land, and the Department was unable to determine whether these properties should be granted voluntary acquisition or mitigation rights under the *Voluntary Land Acquisition and Mitigation Policy*.

Additional assessment by Rio Tinto (see letter forwarded to the PAC in December prior to public hearings) has confirmed that there are no privately-owned vacant lots with more than 25% of land predicted to be affected where construction of a dwelling is permissible under existing planning controls.

Consequently, the only properties that would be in the acquisition zone as a result of air quality impacts in accordance with the *Voluntary Land Acquisition and Mitigation Policy* would be properties 77 and 264 – both located in Warkworth village.

c) *Potential health impacts of long term exposure to dust? Department of Health has indicated that there is “no evidence of a threshold below which exposure to PM is not associated with health impacts.”*

NSW Health's concerns are technically correct, there is no safe level of exposure to particulate matter. However, the health risk decreases with lower levels of exposure.

The applicable impact assessment criteria for particulate matter are health-based criteria sourced from the *National Environment Protection (Ambient Air Quality) Measure* (NEPM) and the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*, and are based on protecting the health of populations due to short and long term exposure to dust.

The air quality modelling in the EIS predicts that apart from Property 77, the mine would comply with the applicable EPA criteria at all residences in the areas surrounding the mine.

The Department notes that it is the smaller particulates less than 10 microns in diameter (i.e. PM₁₀) that are generally associated with adverse health effects. Recent evidence suggests that this association is stronger for particulates below 2.5 µm diameter (i.e. PM_{2.5}), which are predominately generated by combustion processes.

The vast majority of dust from mining activities consists of PM₁₀ (around 40 per cent) and particles larger than PM₁₀ (around 60 per cent), generated from natural activities such as mechanical disturbance of rock and soil materials. PM_{2.5} emissions account for about 5 per cent of the particles emitted during the mining process (mainly from emissions from haul trucks).

There are currently no health-based criteria for PM_{2.5} that have been adopted at the State or Commonwealth level. However, the NEPM includes advisory standards for short term (24-hour) and long term (annual average) exposure to this particulate fraction.

The EIS's for the Warkworth and Mt Thorley Continuation Projects include modelling of PM_{2.5} against the NEPM advisory standards. The modelling indicates that the projects would comply with the advisory standards at all residences in the areas surrounding the mine.

Finally, by way of providing context, the Department notes that the EPA regional air quality monitoring network indicates that PM₁₀ concentrations in the Singleton area are very similar to those in the Sydney metropolitan area. For example, data from the EPA air quality monitoring network shows that the annual average PM₁₀ concentrations in Sydney (Randwick) and Singleton South during 2014 were precisely the same (i.e. 18.2 µg/m³ - which is well below the EPA's ambient air quality goal of 30 µg/m³).

d) *Need for schedule of rehabilitation to minimise impacts on air quality.*

A broad schedule of rehabilitation is included in the mine layout plans in the EISs, which are included in Appendix 2 of the recommended instruments of approval for the projects. These plans show the planned progressive rehabilitation of both sites.

The recommended conditions also require Warkworth and Mt Thorley to undertake progressive rehabilitation and to detail interim rehabilitation to minimise the area exposed for dust generation, as part of the Rehabilitation Management Plans for the projects.

Further, the Department notes that the recommended conditions require Rio Tinto to implement a comprehensive reactive dust management system across both sites, and to comply with applicable dust criteria at receivers. In other words, the Department's recommended approach to managing dust emissions from the site is primarily outcomes focused. Accordingly, it would be up to Rio Tinto to ensure it can demonstrate compliance with its limits at residential receivers around the mine.

Notwithstanding the above, the Department also notes that the EPA is imposing a series of Pollution Reduction Programs (PRPs) on mines throughout NSW under their environment protection licences which focus on dust emission source control.

These PRPs are being imposed as part of the EPA's 'Dust Stop' program that aims to ensure that the most reasonable and feasible particulate control options are implemented by each coal mine in accordance with Katestone Benchmarking Study titled *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* (Katestone Environmental, June 2011).

There are three PRPs being imposed - controlling dust emissions associated with haul roads, dumping of overburden, and wind erosion over exposed areas - which the Katestone Study estimated generate 83% of fugitive dust emissions from coal mines. The most recent PRP relates to wind erosion on exposed surfaces and requires mines to calculate the stabilised and disturbed surface areas within the premises, and compare these to those in the applicable Environmental Assessments for the subject mine.

The EPA will use this information in consultation with other relevant government agencies (such as the Department of Planning & Environment) to consider what action is needed to deliver progressive improvements in managing dust emissions from coal mines.

Finally, in addition to the existing and recommended regulatory arrangements, the Department acknowledges there may be opportunities to strengthen the conditions by carrying through the existing accelerated rehabilitation obligations for the South Pit Area to apply to the entire site, as mentioned above.

e) *Need for more detailed assessment of other emissions associated with diesel use, blast fumes and potential spontaneous combustion.*

The EISs include modelling of emissions associated with diesel use and blasting (based on NO₂, which is the main pollutant associated with these sources).

The assessments indicate that diesel use would comply with the applicable criteria, and that blasting activities can be managed to comply with the criteria subject to prudent and best practice blast management operations (such as scheduling blasts to avoid adverse meteorological conditions).

The recommended conditions require Warkworth and Mt Thorley to minimise dust and fume emissions associated with blasting activities, and to prepare and implement detailed Blast Management Plans which include measures to minimise fume emissions.

The Department has also written to a number of coal mines across NSW (including Rio Tinto) requiring the preparation of a detailed Blast Fume Management Procedure to ensure that the risk of blast fumes leaving the site is appropriately addressed. Rio Tinto's Blast Fume Management Procedure for the Warkworth and Mt Thorley mines has since been submitted and approved by the Department.

The Department is not aware of any incidents of spontaneous combustion at the Warkworth and Mt Thorley mines. This is consistent with the Department's understanding that the coal seams being extracted have a low risk of spontaneous combustion compared with some other seams in the Hunter Valley. Nonetheless, the Rehabilitation Management Plan would be required to include details about depth of cover and other matters to ensure any risk of long term spontaneous combustion is minimised.

4. Final Void

a) *The Department quoted it as 950ha. The proponent claimed it's only about 450ha. The Department's view on the proponent's claim.*

When measured from the post-mining water level (minus 10 m AHD), the surface area of the final void is about 450 ha. When measured from a higher contour closer to the ground surface (approximately 80 m AHD), the surface area is approximately 950 ha.

b) How many final voids are there in the Hunter and what is the total size of these voids?

There are approximately 30 final voids approved to be developed in the Hunter Valley. However, there are very few developed final voids as either mining has not been completed and/or the final void has not been rehabilitated pending the development of future plans for expansion.

The Department is not aware of the total size of these voids. However, it would be very small compared to the total land area of the Hunter Valley. A conservative estimate would be approximately 7,500-10,000 hectares (based on 30 voids at an average size of 250-300 hectares per void). This area represents less than 0.5% of the area of the Upper Hunter region.

c) Is the proposed Warkworth void the largest? If not, how does it compare with the others?

The Warkworth void would not be the largest in the Hunter Valley, but it would be one of the largest. In its submission, Rio Tinto has provided some comparisons of the area of final voids in NSW and Queensland (see Appendix A). For example, the Mt Arthur mine has a final void (catchment) of approximately 1,500 hectares, and the nearby Bulga mine has a final void of around 500 hectares (compared to the 950 hectare void at Warkworth).

d) The proponent claimed the cost to backfill the void is prohibitive (\$500 million). Is this a justifiable reason for not to backfill? Shouldn't the cost of backfill be included as part of the operating cost and factored into the mine plan?

e) What would be a reasonable compromise, of some void, but more backfill?

The Department requires all proponents to consider all 'reasonable and feasible' measures to mitigate the impacts of a proposed development. In this context 'feasible' relates to engineering considerations and what is practical to build or implement, while 'reasonable' relates to the application of judgement in arriving at a decision, taking into account matters such as cost and benefits.

With regard to the proposed final void, Warkworth has provided additional information on the costs and benefits associated with various options to fill or partially fill the void (see Appendix A).

The Department notes that the estimates provided by Rio Tinto are based on DRE's rehabilitation cost calculator, and actual costs are likely to be greater.

Based on these estimates, the Department accepts that it would not be reasonable to impose a condition that requires Rio Tinto to completely or even partially backfill the final void.

To completely fill the void it would cost an additional \$2 billion over the life of the mine. Even the minimum cost associated with reshaping aspects of the final landform would be substantial. For example, it would cost an additional \$143 million to reduce the total area of the void by 54 hectares (i.e. from 445 to 391 hectares), which is equivalent to \$2.6 million per hectare. By comparison, the rural land values of the region range from \$2,000 to \$10,000 per hectare.

The Department also notes that there would be some risks and additional impacts associated with filling the void. These include risks to water resources as the final void may not act as groundwater sink and therefore saline water may migrate off the site. The dust and noise impacts of the mine would also be extended for several years during the filling of the void.

Notwithstanding the above, the Department considers that Rio Tinto should be required to minimise the size and depth of the final void, and to ensure it plans for the future land use of the site in consultation with relevant stakeholders. To this end, the Department recommends that a condition be imposed that requires Warkworth to prepare a Mine Closure Strategy, at least 10 years prior to the completion of mining, to further refine the mine plan to address these matters.

f) The final void, in terms of its potential impacts on the landscape, land use and water quality, is a significant concern to the community. What policy work has been carried out to address the cumulative impacts of these voids in the Hunter Valley?

The NSW Government is currently preparing an Integrated Mining Policy (IMP), which will be a whole of government policy for undertaking effective environmental regulation of mining operations in NSW, to achieve greater regulatory certainty and efficiency, to meet community expectations for addressing the potential impacts of mining, and to contribute to the sustainable development of the mining industry.

The IMP will provide a clear and rigorous assessment framework, setting out the government's policy on key environmental and other planning issues.

Components of the IMP will be delivered on a staged basis. An example is the new *Voluntary Land Acquisition and Mitigation Policy*, which was developed under the IMP and gazetted in December 2014.

Detailed mine design guidelines have been identified as one of the key short-to-medium term products to be delivered under the IMP. These guidelines would cover all aspects of mining proposals from construction to closure, rehabilitation and the proposed final landform, including final voids.

The Department expects these guidelines to be developed in consultation with relevant stakeholders and introduced over the next 12 months.

5. Wallaby Scrub Road

Any negotiation between Singleton Council and the proponent in relation to the closure of Wallaby Scrub Road to compensate for the loss of local infrastructure?

The Department's assessment report includes consideration of the impact of the closure of Wallaby Scrub Road on the regional road network and the surrounding community.

However, the closure of Wallaby Scrub Road would be subject to a separate approval from Singleton Council under the *Roads Act 1993*. Compensation for closure and purchase of the road reserve would be undertaken as part of this process. It is then up to Council how it wishes to allocate these funds.

The Department also notes that Rio Tinto is currently in discussions with Singleton Council in regard to a Voluntary Planning Agreement (VPA). Any contributions under such an agreement could be used by Council towards meeting demands on community infrastructure and services, and to fund any other projects with a broader public benefit.

However, it is important to note that planning agreements are 'voluntary', and the Department is not in a position to impose the terms of any offer that may ultimately be made by Rio Tinto. Planning agreements are also not designed to provide 'compensation' to the affected community.

6. Impacts on Bulga Village

Options to compensate impacts – relocation of the village, establish a community enhancement fund to improve social and physical infrastructures, and guarantee property value

The Department's assessment of the Warkworth and Mt Thorley Continuation Projects indicates that no privately-owned residences within Bulga village would experience noise and/or dust impacts above the applicable acquisition criteria (although one affected property may be said to be located on the northern outskirts of Bulga). An additional 15 residences would be subject to moderate noise and/or dust impacts.

The Department has recommended conditions that would require Rio Tinto to address these impacts in accordance with the NSW Government's *Voluntary Land Acquisition and Mitigation Policy*.

In summary, the assessment of the projects indicates that the vast majority of properties in Bulga would comply with applicable amenity criteria for both dust and noise. These criteria are set by the NSW Government for assessing whether the impacts of a proposed development are acceptable.

Consequently, apart from those with acquisition rights, the Department considers there is no justification for paying compensation to Bulga residents or relocating the village.

With regard to community enhancement, as outlined in the Department's assessment report, Rio Tinto has committed to negotiating a VPA with Singleton Council, which would include public benefit contributions that would be dedicated to maintaining and/or improving local facilities and services in Bulga, other local neighbouring communities and the Singleton LGA as a whole.

The assessment report also includes consideration of the potential impacts of the project on property values in Bulga, noting that mining is likely to have both positive and negative influences on property values. The Department considers that there is no legal basis for guaranteeing property values where a proponent is seeking to develop the site in accordance with a permissible land use.

The Department also notes that the Warkworth mine has been operating since 1981, and Rio Tinto has held a valid mining tenement over the area subject to the current application since that time. It would therefore be reasonable to assume that the presence of open cut mining in the vicinity is a long standing factor in the valuation of properties in Bulga village and surrounds.

7. Aboriginal Heritage

At the public hearing, the Wonnarua Traditional Custodians Group outlined the special significance of Saddleback Ridge as a pathway to Baiamai Cave and Yengo Flat Rock sacred sites. It is claimed that the landscape value and cultural significance of Saddleback Ridge to the aboriginal community have not been addressed in the EISs. What's the Department's view on the claim?

The landscape and cultural significance of the site and the wider locality has been addressed in the EISs for the projects. As outlined in the Department's assessment report for the Warkworth Continuation Project, the Aboriginal community has identified that all land within the project area and surrounds is of high cultural and archaeological significance. This is similar to most other Aboriginal cultural heritage assessments in the Hunter Valley. The Department's assessment of Aboriginal heritage has been undertaken in consideration of this significance.

APPENDIX A – ADDITIONAL INFORMATION FROM RIO TINTO (10 FEBRUARY 2015)

10 February 2015

Mr Mike Young
Manager Mining Projects
Department of Planning ND Environment
GPO Box 39
Sydney NSW 2001

Dear Mr Young

Warkworth Continuation Project (SSD 6464) & Mt Thorley Continuation Project (SSD 6465) – Information Request

The Department of Planning and Environment (DPE) requested further information on the above projects by emails dated 6 and 9 February 2015 to assist the Department in responding to requests from the Planning Assessment Commission.

This letter provides a response to the matters raised.

1.0 Noise

The DPE requested:

More detailed justification as to why it is not possible from a practical and economic perspective (i.e. not reasonable and/or feasible) to accelerate the haul truck noise attenuation program (i.e. before the end of 2016 as currently proposed).

As Mount Thorley Operations and Warkworth Mine (MTW) are existing mines, the ongoing operation relies upon the use of the existing fleet, particularly trucks, to maintain viable production. To retrofit the existing fleet with noise attenuation packages requires the item of fleet to be taken out of service, stripped down, fitted and tested before returning the item back into production. It therefore requires careful planning and logistics.

The noise attenuation packages are not available off the shelf and have required considerable research, development and ongoing testing and refinements. The packages are retrofitted at the Mount Thorley Operations workshop whereas the Warkworth Mine workshop is used for operational servicing of the fleet.

The Mount Thorley workshop has a total of four bays. To strip down and install the attenuation packages requires the use of two bays for each item. Therefore at any one time a maximum of two trucks can be retrofitted. It takes between two to four weeks to retrofit each item of equipment on average, depending on condition and age. Some items are returned to the workshop after installation for refinement. The programme also includes the use of off-site facilities where cost effective to expedite the programme.

The attenuation programme is scheduled progressively, prioritising attenuation on the loudest trucks first and ensuring operations are managed using fleet that has been attenuated in more exposed areas.

Based on the above factors, **Table 1** provides an estimated fleet attenuation schedule. The investment in the attenuation programme is considerable at in excess of \$30M.

Table 1 – Estimated Fleet Attenuation Schedule

Schedule	Truck	Dozer	Drill	Excavator
Completed as of Feb 2015	27	17	3	4
Mar-15	2	1	-	-
Apr-15	3	-	-	-
May-15	3	-	1	-
Jun-15	3	1	-	-
Jul-15	3	-	-	1
Aug-15	2	-	1	-
Sep-15	3	-	-	-
Oct-15	3	2	-	-
Nov-15	3	-	-	-
Dec-15	3	-	-	-
Jan-16	4	-	-	1
Feb-16	3	-	-	-
Mar-16	2	-	-	-
Apr-16	2	1	1	-
May-16	2	1	-	-
Jun-16	2	1	1	-
Jul-16	2	-	-	-
Aug-16	2	1	-	-
Sep-16	2	-	-	-
Oct-16	2	1	-	-
Nov-16	2	1	-	-
Dec-16	-	-	-	-
Total	80	27	7	6

2.0 EPBC Act Approval and Offsets

The DPE requested:

Provide any confirmation received from the Commonwealth that additional approval is not required for the project/s under the EPBC Act.

AND

A summary table of offsets required, offsets proposed and 2003 offsets and any associated mapping. (E Donnelley, pers. comm., 9 February 2015).

2.1 EPBC Act Approval

Section 8.8.3 of the Warkworth Environmental Impact Statement (EIS) indicated that further approvals under the EPBC Act are not required as the development the subject of this proposal already has EPBC Act approval (EPBC 2009/5081).

2.2 Offsets

The 2002 Green Offsets package for Warkworth Mine was one of the first projects in NSW to provide an offset package. Table A.4 of the 2002 Green Offset Strategy provides a summary of vegetation disturbed and offset for the 2003 extension which is summarised in **Table 2**.

The offsets included Non Disturbance Areas (NDAs) and Habitat Management Areas (HMAs), as shown in Figure 12.1 of the EIS. The NDAs were dedicated as areas of protection and enhancement and the HMAs were areas to be managed until required for mining.

Table 2: Offsets - 2003 Development Consent

Component	Disturbance Area (ha)	Land Based Offsets* (ha)		On-site Rehabilitation (ha)
		NDA	HMA	
Warkworth Sands Woodland (WSW)	36.5	20.2	82.5	71.8
Non-WSW	529.4	650.4	782.8	2226.7

* This includes protection and re-establishment of WSW as set out in the 2002 Green Offset Strategy

Conditions 2 and 3 to Schedule 4 of the 2003 development consent required the protection of WSW at a ratio of 2:1 and commitment to re-establish a further 2:1 prior to clearing WSW east of Wallaby Scrub Road. The DPE approved the clearing and offsets for clearing the WSW east of Wallaby Scrub Road under cover of a letter dated 21 November 2013.

The areas of WSW dedicated as offsets under the 2003 development consent area shown as yellow and black hatching in Figure 12.7 and 12.8 of the Environmental Impact Statement (EIS).

The 2014 EIS considered a biodiversity offset strategy for the proposal based on three components, including:

- Component 1 – WSW impacted by the proposals (west of Wallaby Scrub Road);
- Component 2 – non-WSW impacted by the proposal; and
- Component 3 – non-WSW impacted by the 2003 extension.

A summary of each component is provided in **Table 3**.

Table 3: Offsets – Warkworth Continuation 2014

Component	Disturbance Area (ha)	Offsets			Supplementary Measures
		Land Based (ha)	Re-establishment (ha)	Credit Based (ha) via UHSA	
WSW (component 1)	72	75.5 This is from 19.5ha in the NBA and 56ha in the SBA	160	308	• Integrated management plan • Contribution of \$1M to Regent Honeyeater SOS • Implementation bond • Conservation of WSG under 2003 consent • Completion criteria for WSW • \$500,000 used for WSW research under the now rescinded 2012 Warkworth approval • Secure and manage land based offset of equal or greater value of 72ha of WSW to be impacted by continuation (Hanwood Estate, 41.6ha). The OEH have confirmed that the Hanwood Estate's inclusion in the BOS fully satisfies the recommendation to the consent authority for the additional land based offset
Non-WSW (component 2)	611	1673 This is within the Goulburn River and Bowditch offset	1227.5 ^{***}	3278.7	-
Non-WSW from 2003 extension (component 3)	477.5	721 This is entirely in the SBA	872.5	730.2	-

^{*} Area is deduced by dividing the BBAM credits by 9.8, as per the Upper Hunter Strategic Assessment (UHSA)

^{**} On-site Mine rehabilitation

^{***} This area has decreased since the 2003 approval due to a change in mapping criteria of several vegetation communities. The mapping aligns to contemporary mapping, *The Vegetation of the Central Hunter Valley, NSW, Peake 2006*.

The Biodiversity Offset Strategy (BOS) outlined above in **Table 3** was certified by the Office of Environment and Heritage (OEH) in accordance with clause 14(3) of the Mining SEPP which requires the consent authority to consider any certification by the Chief Executive of the OEH that measures to mitigate or offset the biodiversity impact of the proposal will be adequate.

3.0 Air Quality

The DPE requested:

Provide a succinct summary of the compliance of the project/s against the applicable 24-hour PM₁₀ criteria in the gazetted version of the Voluntary Land Acquisition and Mitigation Policy for all privately-owned residential properties and vacant land in the study area.

A summary of PM₁₀, 24 hr monitoring against the criteria in the gazetted version of the *Voluntary Land Acquisition and Mitigation Policy* is provided in **Table 4** from the MTW monitoring network. As can be seen by the results there have not been any exceedances of the criteria by five days or more.

Table 4: Analysis of PM₁₀ 24hr Exceedances

Year	Criteria (µg/m ³)	Monitoring location				
		Warkworth PM10 (formerly LEM)	MTO	Loders Creek (formerly MTIE)	WML	Long Point
2009	50	0	0	1	N/A	N/A
2010	50	0	0	0	N/A	N/A
2011	50	0	0	0	N/A	N/A
2012	50	0	0	0	0	N/A
2013	50	0	0	0	0	N/A
2014	50	0	0	0	0	0

4.0 Final Void

The DPE requested further information in relation to the final void, including:

- clarification of the size of the final void;
- completely or partially filling the void to reduce its size, depth and slopes;
- comparative cost estimates based on industry benchmarks for these options, including consideration of deploying alternative (less costly) equipment during final rehabilitation of the site;
- measures to minimise the impacts of the final void from a community, environmental and land use perspective, having regard to the relative value of the current land use on the subject land; and
- a detailed justification for the void as proposed, including a comparison of the size of final voids in NSW and QLD for mines of a similar size, and with similar mining methods and strip ratios.

Further consideration to each of the matters raised is provided below.

4.1 Clarification of the size of the final void

Reference to a final void size of 445 ha is the in-pit lake based on the groundwater recovery level at a relative level (RL) of -10 m Australian Height Data (AHD) which is predicted to occur 350 years after mining. Reference to a final void size of 950 ha is measured at the pre-mining natural surface level of RL 80 m AHD.

The groundwater studies predict that it would take up to 1,000 years to reach an equilibrium water level of RL 20m AHD, which equates to a surface area of 576 ha.

A schematic diagram illustrating the various reference levels is provided in **Figure 1**.

4.2 Completely or partially filling the void to reduce its size, depth and slopes

An assessment has been undertaken on the volume of fill required to completely or partially fill the void. These options include:

- Base case – Current proposal;
- Option 1 - Fill to natural surface, RL 80 m AHD;
- Option 2 - Fill to 350 year water level, RL -10 m AHD;
- Option 3 - Fill to 1,000 year water level, RL 20 m AHD;
- Option 4 – Reduce highwall and endwall slopes; and
- Option 5 – Reshape low-wall.

A reduction in the depth of mining would require sterilisation of economic coal and has not been considered further.

The change in void area and fill volumes for each option is included in **Table 5**. The change in void area is based on the reference level for the particular option. Each option is provided relative (and in addition to) the base case. To compare each option in lieu of the base case requires the addition of the base case to that option.

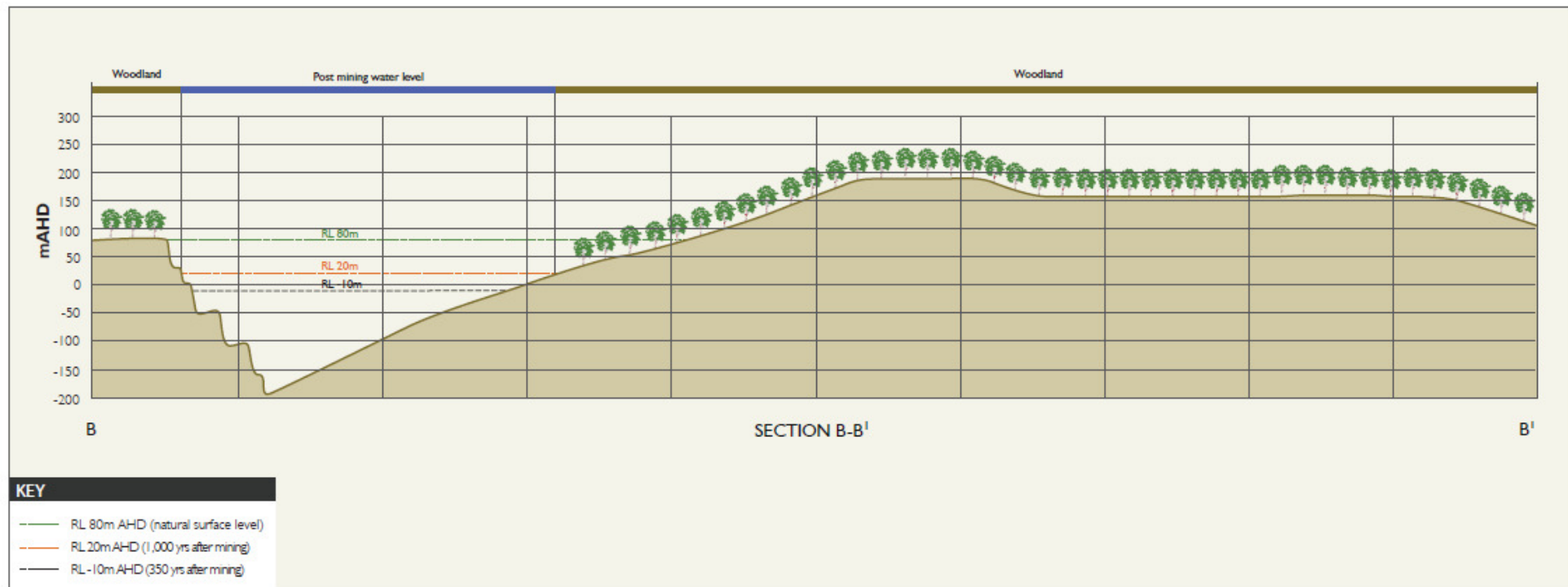


Figure 1 - Final Void Cross Section Schematic (Illustrative Only)

As the table illustrates, a large volume of material would be required to fill the void for each of the options considered. A reduction in slope while accessing the same volume of coal would require an increase in surface area. To reduce the void area by changing slopes whilst not sterilising economic coal would require an increase in slope gradient greater than acceptable slope angles.

4.3 Comparative cost estimates based on industry benchmarks for these options, including consideration of deploying alternative (less costly) equipment during final rehabilitation of the site

A cost estimate for each of the options was considered based on industry benchmarks in **Table 5**. An industry benchmark rate of \$2.53/bank cubic metre (bcm) for carting material was derived from the Department of Trade and Investment, Regional Infrastructure and Services (DRE) Rehabilitation Cost Calculation Tool (November 2012). The actual cost for this activity is likely to be higher deploying MTW equipment and higher again if an external contractor was used. The unit rate excludes costs associated with shaping and rehabilitation which would be significantly higher.

Notwithstanding the above, the DRE rate has been used for comparative purposes. As can be seen from **Table 5** the costs for each option above the base case are cost prohibitive using the conservative DRE rate.

4.4 Measures to minimise the impacts of the final void from a community, environmental and land use perspective, having regard to the relative value of the current land use on the subject land

MTW is a Rio Tinto managed operation and falls under Rio Tinto's Closure Standard which sets out the minimum requirements for planning for closure over the whole life cycle of operations. Closure plans will be developed through the life of the operations taking account of regulatory requirements and stakeholder expectations. Rio Tinto is committed to maintain a positive legacy after mining as a key measure of our contribution to sustainable development, and fundamental to maintaining Rio Tinto's social licence to operate.

The current proposal incorporates reasonable and feasible measures to reduce the size of the final void at an estimated cost of \$127m.

Table 5 also includes an assessment of the cost of filling the void per hectare of reduced void area. These costs range from \$1,900,000/ha to \$14,000,000/ha. Rural land values in the region range from \$2,000/ha to \$10,000/ha. The cost to reclaim land by filling the voids is over 190 times more expensive than rural land values.

Table 5 - Final Void Option Summary

Option	Description	Surface Level (m AHD)	Pre-fill Void Area at Surface Level (ha)	Void Area after Filling (ha)	Change in Area (ha)	Fill Required (Mbcm)	Estimated Fill Cost (\$M)*	Fill Cost/ Change in Area	Comments
Base case	Current Proposal	-10	454	445	9	50	\$127	\$14.1M/ha	Utilises Warkworth overburden to fill Mount Thorley void. Void acts as groundwater sink.
1	Fill to natural surface	80	950	0	950	824 (+50)	\$2,085 (+\$127)	\$2.2M/ha	Requires considerable volumes of material with no convenience source from an operating mine. Potential for void to be a groundwater source rather than a sink.
2	Fill to 350 year water level	-10	445	0	445	335 (+50)	\$848 (+\$127)	\$1.9M/ha	Requires considerable volumes of material with no convenience source from an operating mine. Potential for void to be a groundwater source rather than a sink.
3	Fill to 1,000 year water level	20	576	0	576	476 (+50)	\$1,204 (+\$127)	\$2.1m/ha	Requires considerable volumes of material with no convenience source from an operating mine. Potential for void to be a groundwater source rather than a sink.
4	Reduce highwall and endwall slopes	-10	445	487	-42	170 (+50)	\$430 (+\$127)	N/A (increase)	Using material from the highwall and endwalls would increase the surface area of the void. Void acts as groundwater sink.
5	Reshaping North and West Pit Final Landform	-10	445	391	54	106 (+50)	\$143 (+\$127)	\$2.6M/ha	Require removal of 150 ha rehabilitation. Void acts as groundwater sink.

* Estimated fill cost based on DRE costs calculator of \$2.53/bcm for carting material. Actual costs likely to be significantly higher to shape and rehabilitate.

4.5 A detailed justification for the void as proposed, including a comparison of the size of final voids in NSW and QLD for mines of a similar size, and with similar mining methods and strip ratios

4.5.1 Comparison of final void with other NSW and Qld Mines

A comparison of a final void at one mine to another requires careful consideration of the factors that determine the size of the final void. These factors include the characteristics of the resource and geology for each mine, such as depth of coal seams, number of seams, seam thickness, strip ratio, seam angle and pit length. The main factors that influence size are depth and length.

A comparison is also dependant on the information available in the public domain and the reference levels. From our review there does not appear to be any consistent policy or regulatory basis for the reporting the void size and the various factors that influence its size and the information available requires interpretation.

Notwithstanding this, a review has been undertaken of a number of open cut coal mines in New South Wales (NSW) and Queensland (Qld) using depth and strip ratio (where available) as a relative comparison between mines. Details relating to pit length and numbers of seams were not readily available.

Table 6 provides a summary of the information that could be obtained from the public domain. The limitations of the available data restrict direct comparisons, however, it is noted that while the strip ratio is similar between Warkworth, the approved Mount Arthur operations and those in Queensland, the final void surface area is smaller despite the void being deeper.

4.5.2 Justification

The justification for the final void as proposed is as follows:

- The current proposal results in a net reduction in the current total area and number of approved voids across the MTW whilst recovering a significant economic resource. Removing the Mount Thorley Operations void is only possible under this proposal while Warkworth Mine operates to cost-effectively provide a source of fill material.
- The options of filling the void to the water level occurring 350 years after mining, 1,000 years after mining or to natural surface level respectively are cost prohibitive.
- Reducing the void by reshaping the final landform would add additional costs with little reduction in void area and is therefore not considered reasonable or feasible.
- The cost of reclaiming land by filling the void is over 190 times that of the underlying rural land value.

Table 6 - Other Mine Final Void

Mine	State	Max Depth	Average Strip Ratio*	Final void – water level (ha)	Final void – ground surface level (ha)	Comment
Warkworth Continuation 2014	NSW	310m	6.5:1	445	950	
Mount Pleasant Project	NSW	160m	4:1	471	510	
Mount Arthur Mine	NSW	180m	5:1	N/A	1,420	Reference to catchment area rather than ground surface level. Depth estimation.
Bengalla Continuation Project	NSW	240m	3.5:1	N/A	324	Final void water level predicted to reach up to RL 37mAHD but also states that the water level would vary between RL64m and 71m at 1000 years.
Bulga Coal Mine	NSW	350m	N/A	N/A	500	
Hail Creek Mine	Qld	210m	8:1	N/A	1,540	Internal estimation at crest.
Wandoan Coal Project	Qld	N/A	3 to 5:1	N/A	1,450	Made of up to nine pits.
Caval Ridge Mine	Qld	220m	unknown	N/A	2,000	Estimation– final void size to be confirmed through closure planning and depth estimation based on cross sections.

*Prime overburden divided by run of mine (ROM) coal.

N/A – details not readily available.

We trust that above information will assist with the DPE and Planning Assessment Commission's review of the proposal.

By all means, should you require any further information or clarification, please do not hesitate to contact Nicola Proctor on 02 6575 5825 or the undersigned.

Yours sincerely



Anthony Russo
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Appendix 6

Additional information from the EPA

Kate Wedgwood

From: Kate Wedgwood
Sent: Monday, 2 March 2015 2:41 PM
To: Kate Wedgwood
Subject: FW: Warkworth Continuation project - Air Quality Questions

From: Anthony Savage [<mailto:Anthony.Savage@epa.nsw.gov.au>]
Sent: Friday, 20 February 2015 4:56 PM
To: Helena Miller
Cc: Karen Marler; kate.wedgwood@planning.nsw.gov.au; paula.poon@planning.nsw.gov.au
Subject: RE: Warkworth Continuation project - Air Quality Questions

Hi Helena,

Please see the EPA's responses to your questions below.

- Question - Is the EPA satisfied that the Air Quality Assessment submitted with the application (including EIS and RTS) has been undertaken in accordance with the EPAs Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (subject to additional 24-hour cumulative assessment modelling to be required by DPE prior to determination of the application)?

Answer - As indicated in the EPA's submission dated 13 August 2014, the EPA advises the assessment was undertaken in general accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*.

- Question - Is the EPA satisfied that the modelled years 3, 9 and 14 are appropriate and represent the worst case scenarios?

Answer - In the EPA's submission dated 13 August 2014, the proponent was requested to provide justification for the selection of the modelled years 3, 9 and 14 and how the selected modelling scenarios represent potential worst case. The proponent provided an explanation, in the response to submissions, that the modelled years were selected based on progression of the mine over time and the maximum likely impacts at the eastern, northern and western receivers. This explanation was considered to be adequate by EPA in its submission dated 27 November 2014.

- Question - Is the EPA satisfied that the PM_{2.5} assessment is appropriate / adequate?

Answer - As indicated in the EPA's submission dated 13 August 2014, the EPA advises the assessment was undertaken in general accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*. The general assessment approach adopted is consistent with other mining assessments in NSW using measurements from the State Pollution Control Commission.

Thanks,
Anthony

Anthony Savage
Manager
Air Technical Advisory Services Unit
Air Policy
NSW Environment Protection Authority
Ph: (02) 9995 6085

Appendix 7

Additional information from Dr Broner

11 February 2015

Questions/Request for information – Department of Planning and Environment

1. Noise

a) Background noise level

Table 8.1 of the *Noise and Vibration Study* (Appendix F of the Warkworth EIS) provides the Rated Background Level (RBL) for Bulga. The figures in the table were said to be derived from long term background noise monitoring results.

The BMPA questioned why there is a 3dBA difference in the RBL between Locations B and C when they are only 500m apart. Location B is 367 Wambo Road and Location C is 128 Wambo Road.

What is going on around any given location is clearly very important in determining the background noise level and this needs to be fully understood before making any comparisons. Local noise sources may differ between locations e.g. operating machinery, grazing cattle, presence of trees etc

In Section 8 of the *Noise and Vibration Study*, an explanation of the reason for the differences in RBL as follows:

“Table 8.1 demonstrates relatively higher background noise at locations A, C and F. These locations are in relatively more exposed locations to the mines, Putty Road or the centre of Bulga than the other three locations (refer to Figure 8.1” in Appendix F). It is further explained that three of the locations (B, D and E) have the INP’s minimum threshold background value of 30 dB(A). These locations are relatively more removed from industrial sources (the mines), local road traffic and are further away from the central part of Bulga Village, as compared to the other three locations”.

It is noted that both the Department and the EPA are satisfied with the adopted background noise levels.

The chosen period for assessment for Location B is 01/12/11 – 29/11/12 (11 months), and 29/11/12 to 31/07/13 (8 months) for Location C. The question is if the RBL were derived from long term monitoring data, why use a different period for Locations B and C given their proximity to each other. A common period or at least with some overlapping period would give a better picture of the noise environment for the area.

The periods are clearly consequential. Monitoring at Location B would appear to have happened first and then the monitor was moved to Location C. While the periods are not the same, they are significantly longer than the one week period described as required in the INP and do cover a variety of seasons. Given the length of time monitored at each location, the levels should therefore be very characteristic of the noise levels at those locations. Given the length of time the noise monitoring occurred over, the data should definitely be representative of the noise exposure at the two separate locations, regardless of which periods were used.

What are the reasons for not using the same period/duration for the RBL calculation? The reason is posited above. What is the Department's view on the issue?

b) Monitoring of compliance

How confident is the Department in its ability to monitor noise compliance given the difficulty in separating the noise contribution from each mine, particularly in the integrated operation circumstances?

The following table shows several examples of the applicable noise criteria (PSNL day) for Warkworth and Mt Thorley on the same property.

Property No.	Warkworth Noise Criteria	Mt Thorley Noise Criteria	2012 approval
12 (Bulga)	38dBA	36dBA	38dBA (assuming it falls within the other residences category)
34 (Bulga)	Acquisition	NA	Mitigation
126 & 262 (Gouldsville, Long Point)	41dBA	38dBA	38dBA (assuming it falls within the other residences category)
148 (Mt Thorley)	36dBA	39dBA	Acquisition

Property 34 is on the list of acquisition in the draft conditions for the Warkworth project, but not identified with any noise criteria in the Mt Thorley project unless it falls within the "all other residences" category, in that case, the PSNL will be 35dBA. It was on the mitigation list of the 2012 approval conditions.

The Warkworth PSNL for Property 148 is 36dBA and 39dBA for the Mt Thorley project. But it was on the acquisition list of the 2012 approval. It is easy to understand the frustration and confusion this has created within the community.

I cannot comment on the historical status of property 148, however, given both the 2012 and most recent predictions, there would appear to be no justifiable reason why WML should now have to purchase this property.

Another example is the PSLN for the two current projects for property 148 has a difference of 3dBA. Please explain how monitoring of compliance is to be carried out in relation to this property? How confident is the Department that it can accurately identify and differentiate the source of noise from Warkworth or Mt Thorley given the integrated operation of the two mines?

The Department should be confident that it will be able to monitor compliance. I am led to believe that the Department is conducting a noise validation study in Bulga Village which will allow a comparison between noise levels collected using the Barn Owl system with attended noise monitoring. Any discrepancies between the two noise level measurements will be investigated and understood so that real-time monitoring results used for pro-active management can be validated.

I also note that differentiating between noise from Warkworth and that of Mt Thorley is difficult, however it is no more difficult than differentiating between any two adjoining industrial facilities. This is common in industrial estates around NSW and around the world.

Use of the Barn Owl directional noise monitoring to determine mine contribution is state of the art and consistent with worlds best practice. I also note that often the noise at any one receiver is dominated by noise from one direction due to prevailing wind direction. This will assist in identifying and differentiating between Warkworth and Mt Thorley.

c) Attenuation Program and Current/Proposed Mitigation Measures

Currently only 50% of haul truck fleet has been attenuated. The rest is expected to be attenuated by the end of 2016. Attenuation program for the mining fleet of dozers, excavators and drills will continue are expected to be attenuated by the end of 2016.

Need to accelerate the attenuation program to reduce noise? The benefits of accelerating the attenuation program v the cost?

The effectiveness of the MTW noise management system has been tested on a number of occasions in recent years, including formal compliance audits by Global Acoustics (2004 to present and in more recent years, monitoring has included low frequency noise assessment) and MTW continues to demonstrate a position of overwhelming compliance with noise criteria, and a high level of adherence to the measures outlined in the noise management plan.

Section 10.5.3 of Volume 1 of the Warkworth Continuation 2014 EIS Main Report dated June 2014 explains that an assessment of monitoring data (publically available via the Rio Tinto Coal Australia website www.riotintocoalaustralia.com.au) demonstrates predominant compliance with noise criteria has been achieved throughout the life of the mine. Non-compliant noise measurements account for a small percentage of the monitoring dataset at 0.37 per cent (10 non-compliances measured from 2,689 individual assessments undertaken). These are shown in Tables 10.10 and Table 10.11 excerpted from the report. These tables also demonstrate that there are no sustained exceedances.

Table 10.10 Summary of noise measurements for Warkworth Mine

Total assessments (2004-2014 YTD)	2,689
Total number of exceedances (2004-2013 YTD)	24
Total number of non-compliances (2004-2013 YTD)	10
Percentage of non-compliant assessment (2004-2013 YTD)	0.37

Note: 1. Exceedance refers to a measured result greater than the relevant consent limit, but within the 2dB allowable tolerance listed in Chapter 11 of the INP.

Table 10.11 Yearly breakdown of noise measurements for Warkworth Mine

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total number of assessments	230	276	280	279	292	275	269	290	261	201	36
Total number of exceedances ¹	1	0	1	1	1	8	1	4	4	3	0
Total number of non-compliances	1	0	0	0	0	4	1	2	1	1	0
Non-compliant assessments (%)	0.43	0.00	0.00	0.00	0.00	1.45	0.37	0.69	0.38	1.14	0.00

Note: 1. Exceedance refers to a measured result greater than the relevant consent limit, but within the 2 dB allowable tolerance listed in Chapter 11 of the INP.

If compliance is being achieved, then there is no need to accelerate the noise mitigation program. The current noise emission level management process appears robust and effective. Five Barn Owl loggers are deployed in and around Bulga with thresholds sets to trigger before the criteria are exceeded. Thresholds are set to trigger 2 dBA below the criterion for the given location (and also another trigger is set at the criterion level) and when a threshold is activated, the pro-active noise management team dispatch a Community Assessment Officer to the location to assess what the noise sources are that maybe an issue. The Community Assessment Officer then reports back to the night operations team who then take immediate control actions in terms of modifying operational equipment based on previous protocols to so as to minimise noise emission (if required, the same response approach occurs 24/7). In general, a Community Assessment Officer is in the area every night from around 7 – 8 PM and, depending on weather conditions, may be in the area until 5 – 6 AM. They can and do advise operations if they notice anything which requires attention at any time. The MTW also currently uses a predictive approach to the weather on a daily basis and then decide how to organise the operations accordingly. This is to ensure smooth operations even under adverse propagation conditions and shows a further pro-active approach to noise management. This approach is appropriate and consistent with current world's best practice.

Any additional mitigation measures could be imposed to further reduce the noise impacts?

See the above.

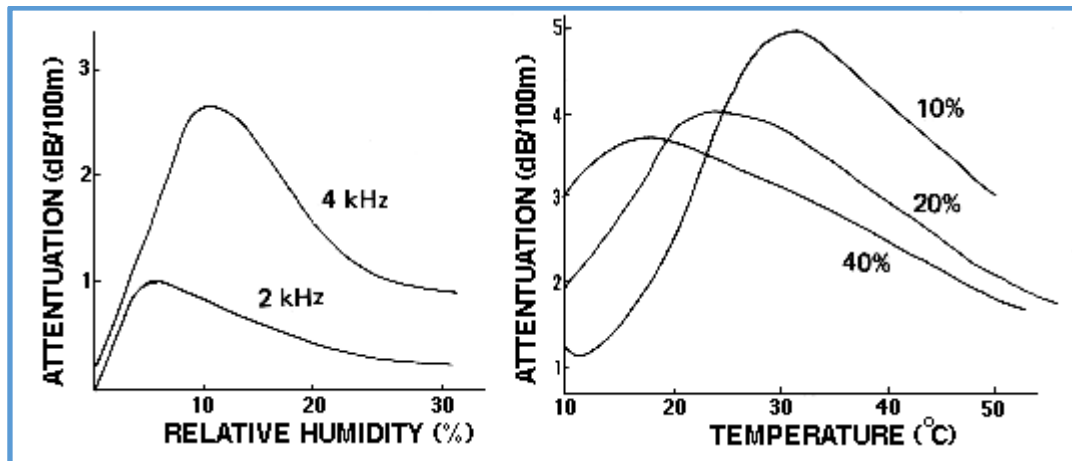
As explained above, if compliance is being achieved, then there is no need to impose additional mitigation.

What's the attenuation effect of Saddleback Ridge – 1-2dBA in the RTS or up to 5DBA in the LEC Judgement?

As explained in LEC, there is up to 5 dB(A) attenuation due to Saddleback Ridge (SR) when the weather conditions are neutral i.e. during calm weather conditions. The performance of an acoustic barrier is dependent on a number of parameters. These include:

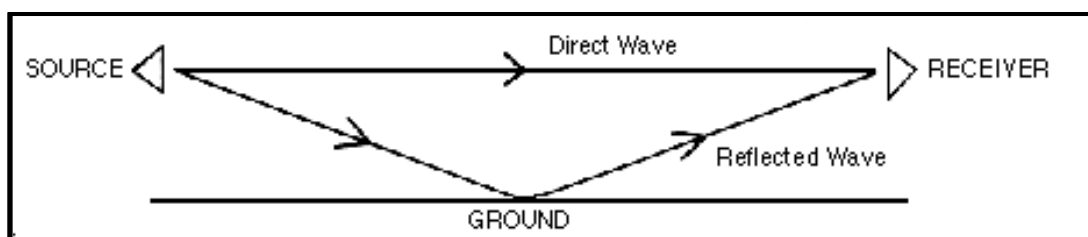
- The material of the barrier
- The distance of the noise source and receiver from the barrier
- The frequency of the noise source
- The ground type between the barrier and noise source and receiver eg concrete or grassland or forest

Noise is attenuated due to air absorption and is dependent on frequency, relative humidity and temperature.



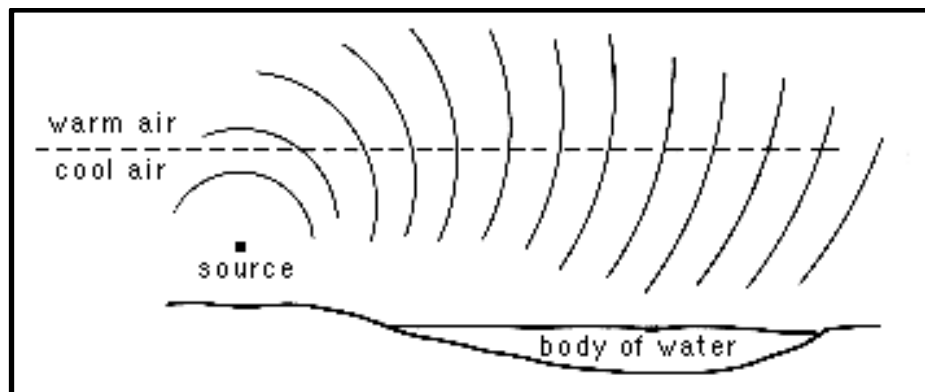
If sound is propagating over ground, attenuation will occur due to acoustic energy losses on reflection. These losses will depend on the surface. Smooth, hard surfaces will produce little absorption whereas thick grass or forests may result in sound levels being reduced by up to about 10 dB per 100 meters at 2000 Hz. High frequencies are generally attenuated more than low frequencies.

Reflection from the ground can result in another mechanism by which sound levels are reduced. When the source and receiver are both close to the ground, the sound wave reflected from the ground may interfere destructively with the direct wave. This effect (called the ground effect) is normally noticed over distances of several meters and more, and in the frequency range of 200-600 Hz. It is highly frequency dependent.

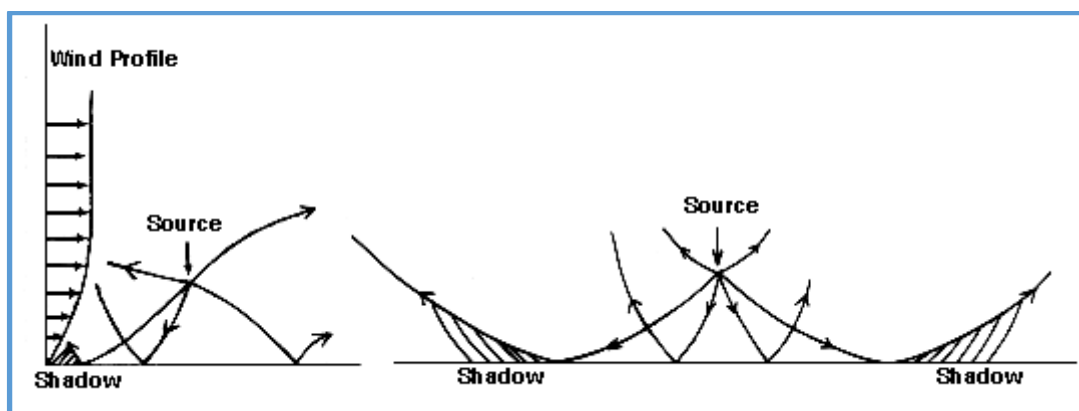


Wind and Temperature Gradients effect the propagation of sound. The speed that sound propagates in a gas depends on the temperature of the gas. Higher temperatures produce higher speeds of sound. Since the temperature of the atmosphere is not uniform, there will be local variations in the sound speed. For example, under normal conditions the atmosphere is cooler at higher altitudes (this is called a temperature lapse condition) and this results in sound waves being 'bent' upwards. This results in the formation of a shadow zone, which is a region in which sound does not penetrate. In reality some sound will enter this zone due to scattering. In environmental noise situations, scattering is caused by air turbulence, rough surfaces, and obstacles such as trees. The scattering of sound by rain, snow or fog at ordinary frequencies is insignificant.

Under conditions of a temperature inversion (this is when the temperature increases with increasing height), the sound waves will be refracted downwards, and therefore the sound may be heard over larger distances. This frequently occurs in winter and at sundown. It is a relatively common occurrence in the Hunter Valley. The figure below shows an example of refraction of sound waves by two layers of air at different temperatures as a result of the change of speed of the sound



When a wind is blowing, there will always be a wind gradient. This is due to the layer of air next to the ground being stationary. A wind gradient results in sound waves propagating upwind being 'bent' upwards and those propagating downwind being 'bent' downwards.

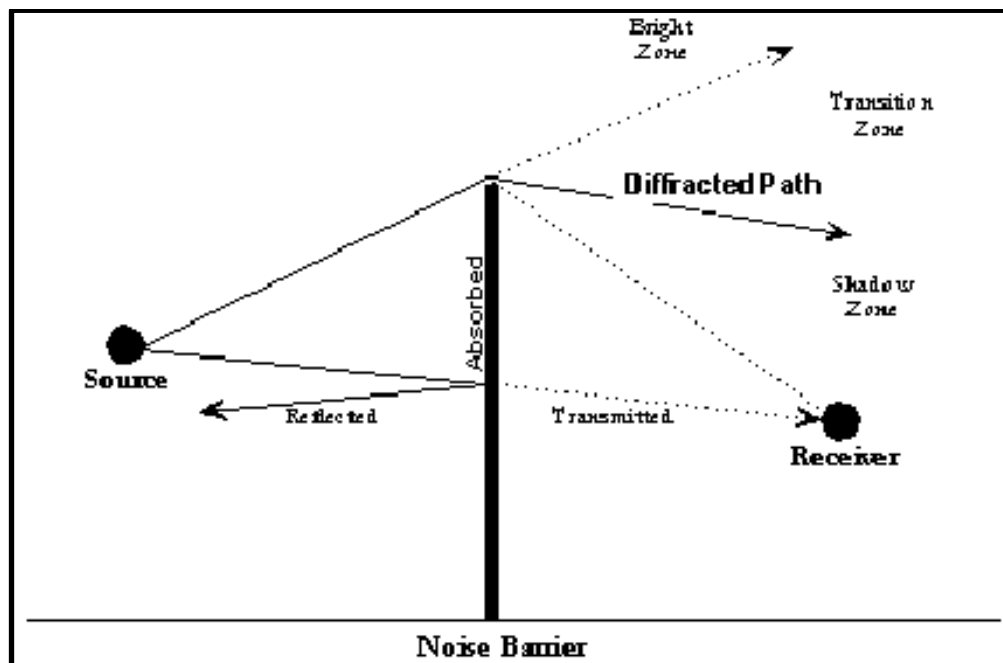


Temperature and wind gradients can result in measured sound levels being very different to those predicted from geometrical spreading and atmospheric absorption considerations alone. These differences may be as great as 10 - 20 dB at some frequencies. In terms of overall noise level the increase is not as substantial, generally in the order of 3 – 5 dBA. Temperature and wind effects are particularly important where sound is propagating over distances greater than a few hundred meters. Importantly, temperature inversions and winds can also result in the effectiveness of a barrier being dramatically reduced due to the sound being “bent around” or being “bent across” the barrier.

Reference:

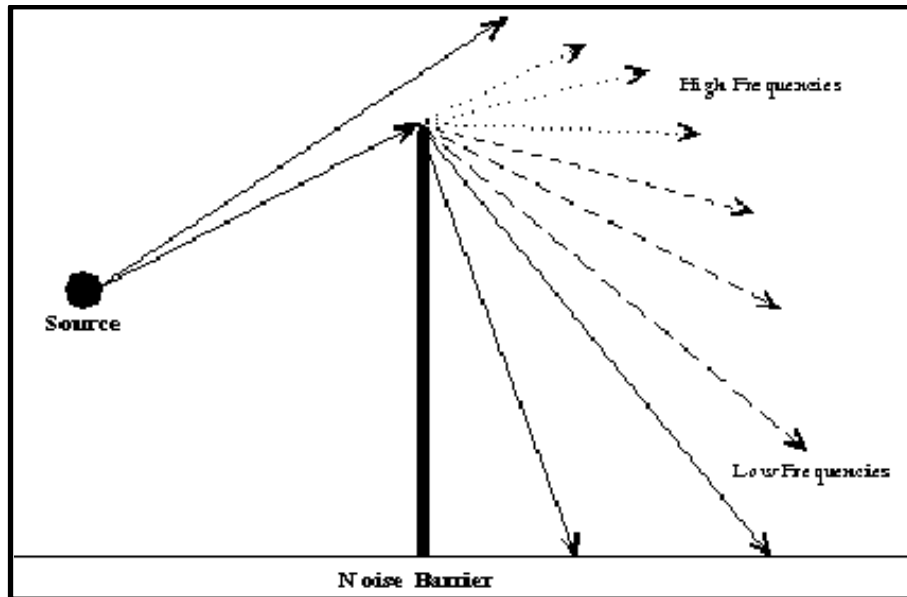
http://www.fhwa.dot.gov/environment/noise/noise_barriers/design_construction/design/design03.cfm

Noise barriers reduce the sound which is received at a receiver by either absorbing it, transmitting it, or by forcing the sound to take a longer path. This longer path is referred to as the diffracted path.



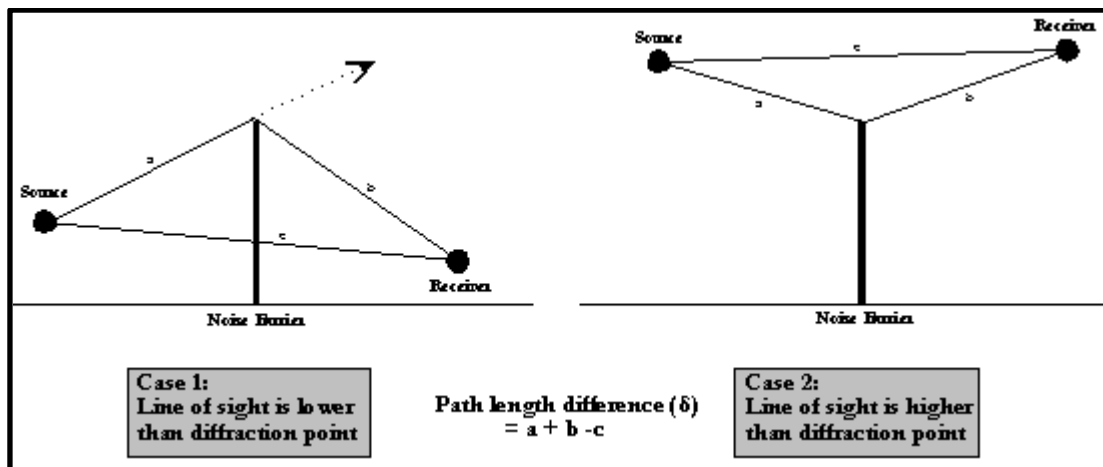
Barrier absorption, transmission, reflection, and diffraction

Diffraction, or the bending of sound waves can occur both at the top of the barrier and around the ends. This bending occurs much like other wave phenomena, such as light and water waves. Due to the nature of sound waves, diffraction does not bend all frequencies uniformly. Higher frequencies (shorter wavelengths) are diffracted to a lesser degree; while lower frequencies (longer wavelengths) are diffracted deeper into the "shadow" zone behind the barrier. As a result, a barrier is, generally, more effective in attenuating the higher frequencies as compared with the lower frequencies.



Barrier diffraction

An important aspect of diffraction is the path length difference (δ) between the diffracted path from source over the top of the barrier to the receiver, and the direct path from source to receiver as if the barrier were not present as can be seen in the Figure below.



Path length difference

The path length difference is determined along the path defined by a particular source-barrier-receiver geometry. If the path length difference increases, the barrier attenuation increases. If the frequency increases, barrier attenuation increases as well. And vice versa. That is why if the source or receiver is very far from the barrier, the barrier will not provide a very high attenuation because the path length difference is relatively decreased. Similarly, with temperature inversion or wind blowing towards the receiver, the effective barrier performance is reduced. So, in Bulga under neutral conditions, the barrier would be more effective at 5 dBA but would only be effective at 1 – 2 dBA under prevailing weather.

Any comments on the claim of insufficient monitoring stations and the poor quality of monitoring results?

Given the above notes regarding compliance and the monitoring program, I would say that the claim is not justified.

d) Low Frequency Noise Level

The SKM April 2012 report “found that low frequency noise impacts were considered to be significant at two locations, and moderate at two further locations.” What action, if any, has been taken to address the issue?

The Warkworth Noise and Vibration Study table 10.12 provides a review of LFN monitoring data for 2013. The table indicates exceedance in 5 locations when applying the INP criteria and 3 locations when applying the Broner criteria.

The EPA in its August 2014 submission to the Department advised that it proposes to apply the methodology for LFN in Table 4.1 of the INP unless further information is provided.

The RTS in section 4.3.1.i confirms that the predicted L_{eqdBC} minus L_{eqdBA} are less than 15dB and, therefore, the INP penalty is not expected to apply during times when mine noise is predicted to be at its highest.

How confident is the Department in the RTS assessment/conclusion when the SKM and the proponent’s 2013 monitoring results both indicated exceedances.

To establish a low frequency (LFN) problem, the INP, in Section 4.1, specifically states in the first paragraph “This section outlines the correction factors to be applied to the source noise level at the receiver before comparison with the criteria specified in Section 2 to account for the additional annoyance caused by these modifying factors”. So, very importantly, the penalty does not apply to general noise. It must be applied specifically to the noise source in question, in this case Warkworth or Mt Thorley separately.

In relation to the results of the independent noise monitoring conducted by SKM in 2012, I note that SKM conducted long term noise level measurements over the order of two months at 8 selected residential locations in the Bulga community and found that the $C - A$ – weighted difference in noise levels exceeded the 15 dB application value for 15 to 45% of night times measurements depending on the measurement location. On the surface, this suggests a significant exceedance in many cases of nights over the monitoring period. However, to determine this, SKM have simply used the overall measured values rather than checking the $(C - A)$ level difference based on the Warkworth or Mt Thorley mine noise itself. It is very important to note that this penalty is to be applied only to the noise due to the noise source under investigation and is **not** meant to be based on a comparison of the overall total measured noise levels. Not calculating the difference appropriately will give misleading results.

In Volume 1 of the in the Warkworth Continuation 2014 – Response to Submissions, an assessment of the $(C - A)$ difference for mine noise was modelled for various locations in Bulga for the Year 9 worst case scenario. None of the differences exceeded 15 dB. This scenario is the worst case scenario across all years and therefore sets the upper bound of expected noise levels from Warkworth mine.

The INP criteria v Broner criteria

The EPA has acknowledged that a test of $C - A > 15$ dB for the LFN penalty to be applied breaks down at larger distances from noise sources due to the natural attenuation difference between high and low frequencies leading to a very unbalanced spectrum at larger distances which by default leads to $(C - A)$ differences greater than 15 dB even though the sound levels at those larger distances are relatively low and would not cause any annoyance.

The $C - A > 15$ dB test was originally developed for assessing noise sources close to the source, not for circumstances where sources are at a kilometre or more away. Note also that localised winds can also cause the $(C - A)$ difference to exceed 15 dB due to the LFN content of wind noise so that a failure of the test could also occur at larger distances solely due to winds.

Dr Broner developed his simplified approach using overall C weighted noise levels for assessment particularly for power stations and other noise sources with a significant low frequency noise imbalance at larger distances and for which the INP approach had significant limitations. Dr Broner believes that these limits could also apply for mine noise though it is possible that the limits could be relaxed for mine noise by say 5 dBC.

In the 2012 SKM report on the monitoring results, SKM also looked at compliance with the Broner overall C – weighted criteria. These results showed, that if the assumption is made that the C weighted level was solely due to the mines, then the desirable criterion was exceeded at night during only 1 – 6 % of the times with one location up to 29%. Over all sites measured, the maximum Broner criterion of 65 dBC was exceeded only 0 – 1% of the time with the highest individual site being 4% of the time. And these results were based on a measurement of all noise, not noise solely due to the noise source.

Based on observations on site, this is a more realistic upper bound of the real LFN problem. In practice, given the distance of the residences from the mines, when the mine noise is audible (excluding any truck exhausts and track slap which have a tonality and which are being addressed), it is audible as a continuum which is not particularly attention getting. This is especially so when wildlife and other background noises are present and which seem to be quite common in the area.

Given the above, the Department should be very confident in the RTS assessment and conclusion.

e) Acquisition

The proponent in its RTS committed to honouring the voluntary acquisition rights granted to some residents under the now rescinded approval for the Warkworth Extension Project 2010. These rights were lost when the LEC overturned the PAC approval in 2013. What's the Department's view on this commitment, and the best way to formalise this commitment?

Should this commitment be extended to the rights to mitigation measures included in the PAC 2012 determination? If not, why not?

This is a matter for the Department, and consequently I have not commented on this issue.

Prepared by:

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