

Peer review of
Economic
Assessment of Mt
Thorley Continuation
Project

Department of Planning
and Environment

16 April 2015

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Glossary

CBA	Cost Benefit Analysis
DAE	Deloitte Access Economics
DPE	Department of Planning and Environment
EIS	Environmental Impact Statement
MTW	Mount Thorley Warkworth
NSW	New South Wales
PAC	Planning Assessment Commission

Executive Summary

DAE has been requested by the Department of Planning and Environment to undertake a review of the economic components of the response to the PAC reviews of the Mt Thorley and Warkworth mine proposals as well as provide an analysis of the December response by Rio Tinto to our original peer review of the economic analysis of the proposals.

This report draws on and is motivated by a number of previous reports which embody the planning decision making process up to this point:

- The original economic analysis undertaken by BAEconomics titled “Economic Impact Assessment for Warkworth Continuation 2014 and Mount Thorley Operations 2014”.
- The DAE peer review “Peer review of economic assessment of Mount Thorley Warkworth extension”.
- A response from Rio Tinto to this peer review in a letter dated 10 December 2014.
- The PAC reviews “Warkworth Continuation Project Review Report” and “Mt Thorley Continuation Project Review Report”.
- Coal and Allied’s responses to the PAC reviews.

Response to Peer Review

The response provided by Rio Tinto includes some useful information that was not included in the original report and clarifies Rio Tinto’s position regarding the commercial sensitivity of some cost data. We accept the commercial sensitivity of this data and agree that including it in a public document may not be appropriate. Having said this, industry benchmark values may be a reasonable way to overcome the need to divulge commercially sensitive data. We also note that some of the additional information requested under current guidelines is not necessarily binding on the proponent.

However, while the response goes some way to addressing the concerns we raised in the previous peer review, the response does not sufficiently address two broad areas where further improvement would ensure that the CBA meets guidelines and best practice. These two areas are: the presentation of the CBA; and the treatment of externalities.

The initial peer review noted that the CBA provided an analysis from the State’s perspective without providing an initial project-level assessment. While the state level perspective is sufficient to meet the assessment requirements, the lack of a project-level analysis makes the analysis complex from reader’s perspective. Although commercial sensitivity of project cost information may prohibit a fully transparent project level analysis, the general framework could be presented before stating which parts of this framework are applicable for the State level analysis.

Our concerns with the treatment of externalities are largely the same as in the previous review we undertook. First, the defensive expenditure approach is inappropriate when more direct and accurate approaches to valuing externalities are available. We do not accept the reasons provided to justify the use of defensive expenditures in the response. Further, we believe that more work can be done to quantify externalities, including those

that fall below threshold levels. Effects which fall below threshold levels do not have zero impact on local residents as the report implies. Nonetheless, we note that any additional quantification would not materially alter the findings of the analysis.

More broadly, we are concerned that the report takes the approach of doing the minimum required to address the Secretary's requirements, without making sufficient effort to provide analysis that is useful for decision makers and stakeholders. There is a gap between the level of analysis that is judged to meet the requirements and that which would be considered best practice. Proponents should be encouraged to strive for best practice where practicable and not to simply provide a minimum level of quality. In the long run, a do-minimum approach will reduce the level of information available to decision makers and stakeholders which will increase the risk of adverse and economically inefficient decisions being made.

We maintain our finding that the analysis contained in the original BAEconomics analysis is broadly appropriate. DAE considers that the Secretary's Environmental Assessment Requirements in respect to economic assessment have been met.

The additional information provided in the response to the peer review provides some further clarification of the analysis. We also acknowledge that there are legitimate concerns around providing some cost information and that some of the additional information requested under current guidelines is not necessarily binding on the proponent.

We maintain concerns over the presentation of the CBA and the treatment of externalities. However, neither of these issues will affect the overall findings of the cost benefit analysis.

Response to PAC review

Overall, the requirements stemming from the PAC reviews are relatively minor as they only require a small update to the original modelling to "reflect the current economic climate".

Our investigations indicate that the mechanics of how the economic assessment has been updated are appropriate. We also consider that BAEconomics' interpretation of the "current economic climate" is reasonable. The finding, that the project still results in an estimated net benefit to NSW, is expected given the scale of the adjustments required.

We consider that the BAEconomics report "Response to Planning Assessment Commission Recommendations on Economic Impact Assessment for Warkworth and Mount Thorley Continuation Projects" meets the requirements set out by the PAC in its reviews "Warkworth Continuation Project Review Report" and "Mt Thorley Continuation Project Review Report".

Deloitte Access Economics

1 Introduction

This report is a summary, review and analysis of the economic assessment of the proposed Mt Thorley and Warkworth continuation projects. The analysis draws on and is motivated by a number of previous reports which embody the planning decision making process up to this point:

- The original economic analysis was undertaken by BAEconomics and is contained in Appendix E of the Environmental Impact Statement (EIS) submissions for both the Mt Thorley Continuation Project and the Warkworth Continuation Project. Appendix E for both EISs is titled “Economic Impact Assessment for Warkworth Continuation 2014 and Mount Thorley Operations 2014”.
- DAE was engaged by the Department of Planning and Environment to prepare a peer review of this original economic analysis. This peer review appears as “Peer review of economic assessment of Mount Thorley Warkworth extension” dated 7 November 2014 and is incorporated into the Recommendation to the Planning Assessment Commission (PAC).
- Rio Tinto provided a response to this peer review in a letter dated 10 December 2014 this was also incorporated into the Recommendation to the PAC.
- The PAC provided its reviews “Warkworth Continuation Project Review Report” and “Mt Thorley Continuation Project Review Report” on 4 March 2015. The reviews are largely identical and included consideration of the previous 3 documents. The PAC reviews requested some additional economic analysis from BAEconomics and an additional review from DAE.
- Responses to the PAC reviews were issued in March by Coal and Allied titled “Response to Planning Assessment Commission review report”. Both responses contain an appendix from BAEconomics that responds to the PAC review’s comments on the economic analysis.

Aligning with the PAC Review’s recommendation, DAE has been requested by the Department of Planning and Environment to undertake a review of the economic components of Coal and Allied’s response to the PAC reviews as well as provide an analysis of the December response by Rio Tinto to our original peer review.

This document is not a stand-alone report and should be read in the context of the preceding documents described above.

The report is set out as follows:

- Section 2 contains an analysis of the response to our original peer review; and
- Section 3 contains an analysis of the response the PAC review.

2 Response to peer review

2.1 Background

BAEconomics was commissioned by Rio Tinto to undertake an economic impact assessment of the Mount Thorley and Warkworth projects in 2014. The findings of this assessment are contained in Appendix E of the relevant EIS submissions: *Economic Impact Assessment for Warkworth Continuation 2014 and Mount Thorley Operations 2014* (the Report).

Deloitte Access Economics was subsequently commissioned by the Department of Planning and the Environment (DPE) to prepare a peer review (the Review) of this work. This was submitted on 7 November 2014. That review found that while the Report broadly met the Secretary's Environmental Assessment Requirements, there were areas of the analysis that fell short of best practice cost benefit analysis principles. Rio Tinto provided a response to this review on 10 December 2014.

This current report identifies whether this response adequately addresses the areas identified in the initial peer review, and whether further work could improve the analysis and be reasonably expected given commercial concerns and the findings of the analysis to date.

2.2 Overview of findings of peer review

The initial review found that the Report had undertaken a CBA that included the key impacts of the proposal on the State, both through financial impacts and through local externalities caused. However, it saw that there was room for improvement in the way that the findings were presented in the Report. In particular, the recommendations fell into three areas:

- The presentation and transparency of the CBA;
- The potential for improving the treatment of externalities in the Report; and
- One area in which information required for the Secretary's Guidelines had not been included.

The CBA included in the Report appeared broadly sound and included the main impacts that would be expected to impact on the NSW community. However, the Report did not include a CBA at the project level. The Review recommended that a project-level CBA be explicitly included in order to anchor the results presented at the State and local levels. For example, the Report did not include any information on the project costs and therefore gave the impression that the proposal was in some sense costless. Given that the costs would be known to the proponent, and indeed had been used to estimate tax flows, little extra work would be required to include this information in the Report.

The Review recommended that the transparency of the CBA could also be improved by explicitly setting out the impacts of the project over the project lifespan, rather than including a single net present value (NPV) figure. Finally, some key variables, such as coal price forecasts over the life of the project, were not included in the report.

The Report was found to include a relatively thorough qualitative treatment of the externalities that were likely to result. However, the Review made several recommendations to improve on the presentation. First, it advised that some of the impacts that had been treated only qualitatively could be quantified using accepted approaches.

Second, where the impacts were expected to be attenuated, it appeared that the benefits of doing so were being estimated as the cost of attenuation, not the reduction in externalities that it would create. That is, the Report used the 'defensive expenditure' as a measure for the benefit of reduced externalities, while noting that this expenditure need not be a measure for these benefits. The Review agreed with this latter assessment and found that an approach based on defensive expenditure was an inaccurate measure for valuing the impacts on local residents as there need not be a one-for-one link between expenditure on remedying an external cost and the reduction in that cost. Overall, it was found that the approach to quantifying the final external impacts could be significantly improved.

Third, the Report noted that, after attenuation, some external effects would fall below threshold levels and therefore need not be quantified. While this approach would be sufficient to meet the Secretary's Guidelines, best practice CBA would be to estimate all external impacts that affect the wellbeing of local residents, whether they lie above threshold levels or not.

Finally, the Review found that the reporting of external impacts could be treated more clearly. Attenuation activity was recorded as a benefit to local residents, even if it merely restored them to initial levels of wellbeing. While the way this was accounted for in the CBA meant this netted out with attenuation costs, it was found to be misleading as residents would not be better off relative to the baseline scenario. Further, the Review found it unlikely that external effects would be fully attenuated.

The Review included a thorough assessment of the Report against the Secretary's Guidelines. It was found to meet almost all guidelines and be broadly sound. However, no information was provided on any additional infrastructure or services that would need to be provided to meet the requirements of the mine extensions.

The Review also included a data request to assist in clarifying the data that would be needed to undertake a CBA that better met best practice guidelines. This data request primarily consisted of key data along the lines outlined above: data on project costs, key parameters, and the data that would be needed for a more complete treatment of externalities.

2.3 Overview of response to peer review

Rio Tinto's response to the Review included a significant amount of material that had been requested by that document. In particular, the response included information on:

- The coal products to be produced by the extension (both name and type of coal);
- Forecast annual coal prices and their sources;
- Quantities of coal expected to be produced;
- Other on-site revenue;
- Details of capital expenditure required;
- The residual value of capital and land;
- Off-site agricultural revenue impacts;
- Related public expenditure;
- Carbon emissions from each mine site;
- Air pollution (particulate matter) and noise pollution;
- Quality of open space; and
- Impacts on rural amenity and culture.

The response does not include any additional information on key cost parameters, including operating costs, exploration costs or rehabilitation and decommissioning costs. Rio Tinto state that this information is commercial-in-confidence and is therefore not appropriate to publish. Further, it states that the level of information requested by the peer review is greater than has been provided in any previous assessment.

In lieu of providing detailed cost data, the response includes a summary of the CBA contained in the initial Report benchmarked against CBA results from other recent coal projects. While it shows the scale, and size of the benefits to the State, are broadly similar to other projects, it notes that these results do not include costs and are not comparable.

The response then provides a greater level of detail to address specific issues raised in the peer review. These are discussed in turn below.

Coal prices

The response notes that the relevant coal price is the long term average price over the term of the project and that this projection does not fluctuate year-to-year. The value used is therefore a constant amount, based on forecasts provided by four broker commodity reports. It notes that the average price used in the CBA is somewhat lower than that used in the NSW Government budget (\$85 per tonne, relative to \$90 per tonne). Given the lack of fluctuation over time, the response argues that it is unnecessary to report an annual price forecast.

Treatment of externalities

The response to the peer review reaffirms the initial 'defensive expenditure' approach to valuing the attenuation that is expected to take place. It argues that this expenditure provides a revealed value of the benefits; seemingly stating that given society's expectation that the attenuation take place, the cost must be less than the externality it reduces.

On the issue of valuing externalities below threshold levels, the response also asserts the original approach as being accurate. It states that being required to value costs below that threshold is equivalent to asserting that the government has been inaccurate in setting the threshold.

Provision of local services and VPA

The response notes that the Environmental Impact Statements provided details of the impact on local infrastructure and any Voluntary Planning Agreements that would be entered into. This information is clearly presented and is sufficient to meet the requirements.

2.4 Analysis of response and conclusions

Rio Tinto responded to DAE's peer review on 10 December 2014. Table 2.1 provides an overview of Rio Tinto's response to DAE's comments.

Table 2.1: Summary of Rio Tinto's response to peer review

Topic	DAE comments	Rio Tinto response
Project-level CBA	A significant weakness of the analysis is the exclusion of a CBA from the project perspective, with the report only providing a State and regional analysis.	Provided selected components of the project level CBA calculation, including production profile, coal price projections, and various cost components. However, project level capital and operating costs are not provided.
Coal price	The report should provide an annual coal price forecast over the life of the proposal as well as more details around the derivation of the forecasts.	Provided coal price forecast from 2014 to 2035 along with references to broker publications.
Impact timeline	In general, a timeline of all quantified impacts should be provided, rather than simply providing a single NPV figure.	Provided an impact timeline for air pollution, noise pollution, and rural amenity and culture.
Additional output	Further details on the amount of output expected in each year, the quality of the coal expected to be produced and whether the incremental output is expected to be exported or used domestically should all be included.	Provided information on additional production capacity and type of coal produced at project level. Did not provide information on whether incremental output is to be exported or used domestically.
Costs	More details should be given on capital costs, operating costs, infrastructure costs, and any other costs incurred by the project over its life.	Provided high-level summary of combined project capital expenditure costs. Did not provide operating costs for either project.
Treatment of externality	Further effort to quantify the residual external costs even when they don't exceed a regulatory threshold and are small in scale.	Responded in comment: "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 values."
	Clearly set out the attenuating activity proposed by Rio Tinto and identify its costs over the life of the project.	Rehabilitation and decommissioning costs are commercial-in-confidence.
	Identify the residual externalities the community will face after this attenuation. Attribute these residual impacts as costs in the CBA and reduce the current external benefits estimates to zero.	Responded in comment: "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."
Local infrastructure and service	There is currently no discussion in the report on whether the extension may require additional infrastructure or whether a Voluntary Planning Agreement will be entered into with the local government. If there is no requirement for additional infrastructure, the report should note this.	Responded in comment: "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."

Source: Deloitte Access Economics

DAE understands that Rio Tinto is a publicly listed company and as such, has certain legal and commercial concerns about disclosing detailed project costing information requested by DAE, as this information may inadvertently reveal commercial-in-confidence material. While industry benchmark values may be a reasonable way to overcome the need to divulge commercially sensitive data, the following analysis of Rio Tinto's response will draw on this consideration. In addition, the analysis will also consider whether new information

supplied by Rio Tinto provides sufficient clarity and insights into the findings and assumptions of the original CBA.

DAE welcomes the additional information provided by Rio Tinto. Information around coal price assumptions, additional outputs and timeline of externality impacts were particularly useful in understanding the approach undertaken by BAEconomics when conducting the CBA. It is also worth noting while some new information, such as project operating and capital costs, does not fully meet the data request outlined in DAE's peer review, it does provide sufficient insight into the findings of the original CBA and improves the overall clarity of the economic assessment. DAE has estimated average operating costs for the project drawing from the additional information provided, and has found that it is within the range observed for other open cut coal mines in NSW.

Furthermore, DAE considers that the Secretary's Environmental Assessment Requirements in respect to economic assessment have been fully met and acknowledges that some of the additional information requested under current guidelines is not necessarily binding on the proponent.

The discussion below provides our views against specific areas of the response.

Presentation of results in the CBA

While the initial peer review acknowledged that the CBA was broadly sound and met the majority of the requirements, it noted that the overall quality of the CBA could be improved through presenting the results in a clearer manner. Better presentation will make results easier to understand for stakeholders and allow a more meaningful discussion of the analysis. Our views on this have not changed.

As noted in the Review, the Report would benefit from a higher-level discussion of the total project impacts before embarking on the State and local level CBAs. As above, we acknowledge that some cost information is commercially sensitive and need not be included. However, the Report could be improved simply through a qualitative discussion of the CBA framework as set out in the Review, and note that some impacts that are costs at the project level will be benefits to the State, and that other costs will be borne outside the State and are therefore not included in the CBA.

This framework is implicit in the Report but making it explicit would help provide clarity to readers. Further, presenting a regional CBA without an overarching analysis is not a common approach and this increases the rationale for a more detailed discussion of the framework.

The initial Review found that greater clarity would also be provided through making explicit the impacts and assumptions around various parameters on an annual basis. The responses to the data request helps provide this transparency.

In summary, the ultimate goal of a CBA is to analyse a project and present the findings in a thorough and informative way to stakeholders and decision makers. We continue to consider that this could be significantly improved by framing the analysis within a project level CBA.

Treatment of externalities

We disagree with the treatment of externalities in the Report and in the response to the Review. We continue to have three main concerns:

- The benefits from attenuation are incorrectly measured as the amount of expenditure required to remove the externality, rather than the effect that this expenditure has;
- The presentation of externalities in the report, where quantified, implies that local residents are better off in the extension scenario than they are in the absence of an extension; and
- Local residents can be negatively impacted even when externalities fall below threshold levels, and best practice analysis would seek to quantify these impacts.

There need not be any one-for-one relationship between the amount of money spent on reducing externalities and the dollar reduction in externalities that results. Simply, spending one dollar on attenuating an externality may lead to benefits of less than, equal to, or greater than one dollar depending on how effective that spending is. As noted by the Report, *'defensive expenditures may represent an under- or overestimate of the value of the non-market impact on wellbeing'*. Given this, the Report should attempt to demonstrate how this spending will reduce the externality, and in particular how it will fully reduce the externality to zero. Simply assuming that this reduction will occur one-for-one with spending and that all externalities will be fully removed is not an appropriate approach.

The response appears to state that the benefits of this expenditure are 'revealed' to be at least as large as the expenditure simply by the fact that the proponent is required to engage in attenuation. We do not accept this argument in general, and in particular think this justification is weak on a project-by-project level. Given that there are simple and proven methods for quantifying external impacts that have been used in previous analyses; we recommend that this analysis could be improved by more directly addressing these issues.

We also disagree with the implication that the setting of threshold levels of external costs implies that costs below these thresholds are zero. Thresholds are pragmatic settings based on the understanding that some level of reduction in local wellbeing is to be accepted but that a line should be drawn at the point where these negative impacts are judged to be excessive. This line is not drawn at zero and negative impacts will occur through externalities below these thresholds. A best practice analysis would seek to quantify these costs, even if they are expected to be small.

Finally, we remain of the opinion that the presentation of external costs in the Report is inappropriate. Table 3.3 implies that local residents receive benefits (offsets) relative to the baseline scenario, an implication which is not correct. We understand that these benefits are offset by the costs and therefore net to zero, however, this should be made clearer in the presentation. Further, given the inappropriate use of defensive expenditure in valuing these impacts, there is no reason that the two columns in that table should equal.

We acknowledge that the findings of the CBA mean that the external impacts are not of a size that will change the result that the project will create a positive NPV for the State. The

comments above are instead meant to reflect what would be best practice, rather than information which is pivotal to the analysis.

Regional analysis

We maintain our finding that the economic analysis is broadly sound and provides a good overview of the regional impacts of the proposal, both at the NSW and local level. We believe that the additional information provided supports this position further particularly in providing more detail on the demand for the provision of local infrastructure and services.

Summary

We maintain our finding that the analysis contained in the Report is broadly appropriate. Further, the additional information provided in the response to the peer review provides some further clarification of the analysis. We also acknowledge that there are legitimate concerns around providing some cost information.

Our primary concern continues to relate to the treatment of externalities. The method for estimating these impacts could be significantly improved and the current presentation is somewhat misleading. While there is significant scope for improving this area of the analysis, we note that doing so would not materially alter the outcome of the CBA.

More broadly, we recognise that while the Secretary's Guidelines provide a minimum threshold of quality that assessments are required to meet. There is some gap between this minimum threshold and what would constitute a high quality CBA, both in terms of the rigour taken to valuing impacts and in the way in which this analysis is communicated to decision makers. We would be concerned if proponents saw the Secretary's Guidelines as a mere hurdle to jump and did not attempt to produce high quality CBAs as a result. In their response, Rio Tinto refer to acceptable standards in previous CBAs and reportedly see little reason in surpassing these standards. It will be important that these precedents are not seen as providing the benchmark level of quality and that proponents seek to provide the best analysis practicable in their assessments.

3 Response to PAC review

3.1 Background

This section of the report covers the economic components of the response by Coal and Allied to the PAC review issued in March 2015. The immediate background for this response is:

- The PAC provided its reviews “Warkworth Continuation Project Review Report” and “Mt Thorley Continuation Project Review Report” on 4 March 2015. The reviews are largely identical and included consideration of the previous 3 documents. The PAC reviews requested some additional economic analysis from BAEconomics and an additional review from DAE.
- Responses to the PAC reviews were issued in March by Coal and Allied titled “Response to Planning Assessment Commission review report”. Both responses contain an appendix from BAEconomics that responds to the PAC review’s comments on the economic analysis.

3.2 Overview of findings of PAC review

Only a small portion of the PAC reviews are of economic relevance. In particular, section 5.1 contains the PAC’s review of economic related matters. In summary the PAC:

- Accepts that the resource can be considered significant as its extraction would deliver substantial benefits to the region and state of NSW.
- Requires that the economic assessment should be updated to reflect the current economic climate.
- Requires that DAE should be asked to review the information provided by Rio Tinto in its letter from December 2014 and any updated economic assessment/CBA provided by Rio Tinto. DAE should provide updated advice to the consent authority.

Within section 5.1 of the PAC review, section 5.1.3 contains a detailed discussion of economic impacts to Bulga Village and what options should be considered for the future of Bulga Village. The recommendation of the PAC in section 5.1.3 is beyond the scope of our review of the original economic analysis.

3.3 Overview of response to review

The direct response by Coal and Allied to the PAC reviews is contained in section 4.1 of its reports “Response to Planning Assessment Commission review report”. This section is largely a restatement of the findings of the updated economic analysis by BAEconomics set out in Appendix A of those reports. The review below therefore focusses on the BAEconomics report.

The BAEconomics report responds to the first PAC recommendation that “the Applicant’s economic assessment, including the CBA, should be updated to reflect the current economic climate” and notes that the second recommendation, relating to Deloitte Access Economics is a matter for the Department of Planning and Environment.

In summary, the BAEconomics’ report submits that:

- “current economic climate” refers to the current lower spot and forecast prices for thermal coal and exchange rate assumptions.
- The sensitivity analysis presented in the original BAEconomics report encompasses the current economic climate being experienced in the Australian and international thermal coal market.
- The net present value to NSW of the continuation of MTW for the central case using the most recent consensus forecasts for both thermal coal prices and the exchange rate is A\$1,491m in benefits compared to the previous estimate of A\$1,501m.

3.4 Analysis of response and conclusions

As an initial step in the review, we have cross checked the updated figures used by BAEconomics. The updated price and exchange rate estimates that have been employed appear to be consistent with recent forecasts from publically available analyst and broker reports.

Overall, the requirements stemming from the PAC reviews are relatively minor as they only require a small update to the original modelling. Our investigations indicate that the mechanics of how the economic assessment has been updated are appropriate. We also consider that BAEconomics’ interpretation of the “current economic climate” is reasonable as the major determinants of the net benefits of a coal project that relate to the economic climate are the coal price and the exchange rate. The finding, that the project still results in an estimated net benefit to NSW, is expected given the scale of the adjustments incorporated.

In summary, we consider that the BAEconomics’ report “Response to Planning Assessment Commission Recommendations on Economic Impact Assessment for Warkworth And Mount Thorley Continuation Projects” meets the requirements set out by the PAC in its reviews “Warkworth Continuation Project Review Report” and “Mt Thorley Continuation Project Review Report”.

Limitation of our work

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