



REVIEW REPORT

OCTOBER 2015

Drayton South Coal Mine: Review PAC

Independent review of the Economic Assessment

Report prepared for Coolmore Australia and Darley
Australia

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Executive summary

Marsden Jacob Associates (Marsden Jacob) was engaged by Coolmore Australia and Darley Australia to review the economic assessment of the Drayton South open-cut coal mine. Marsden Jacob's review has focused on the economic viability as reported in the cost-benefit analysis, not the financial viability, of the Drayton South open-cut coal mine.

On 11 September 2015, Marsden Jacob presented the 'summary' conclusions of our review at the Review Planning Assessment Commission (PAC) hearing in Denman.

Marsden Jacob has reviewed the approach, assumptions and present value calculations by Gillespie Economics of the proposed Drayton South open-cut coal mine. This explains why our conclusions differ from the other peer reviewers, because: BDA Group (Anglo American's peer reviewer) states that *"No attempt has been made to check the data used, or review the computational accuracy of the spreadsheet based economic model"*; and Deloitte Access Economics (NSW Government's peer reviewer) makes no comment on the computational accuracy of the economic analysis.

Marsden Jacob attempted to check the computation accuracy of the entire cost-benefit analysis, but because we do not have access to the spreadsheet model and many of the assumptions are only reported as aggregate present values it was not possible to check many of the results.

Key Conclusions

Four key conclusions emerged from Marsden Jacob's review of the economic analysis.

Conclusion 1: The economic analysis over-estimates the net social benefit of the proposed mine by at least \$538 million, even before other costs such as capital, production tonnages and impacts on the neighbouring studs are factored into the analysis (see Section 2).

The economic analysis of the proposed Drayton South open-cut coal mine needs to assess the full range of costs and benefits in a balanced, detailed and demonstrably unbiased manner.

Marsden Jacob's review of the Drayton South open-cut coal mine economic analysis has identified that net social benefit of the proposed mine is over-estimated by at least \$538 million (present value). Furthermore, this reduction in the net social benefit is conservative because it only factors in changes to the value of coal, value of greenhouse gas emissions, aboriginal heritage and travel time impacts.

The reduction in the net social benefit could be significantly higher if other costs were included, such as: missing capital costs (approximately \$40-50 million PV); impacts that would result if product coal tonnes are over-estimated (close to \$1 billion PV) and state impacts that emerge if Coolmore Australia and Darley Australia are forced to relocate interstate (up to \$368 million PV). In summary, Marsden Jacob's review identifies that benefits and costs have potentially been misestimated by around \$1.5 billion (PV).

The problems with the economic analysis of the Drayton South open-cut coal mine are discussed briefly in Table 1 and detailed in Section 2.

Table 1: Under-estimated costs and over-estimated benefits

	Under-estimated costs	Over-estimated benefits	Comments
Value of Coal		~\$413 million (PV)	Value of coal reduces when correctly calculated using Anglo American’s stated production schedule and Gillespie Economics’ stated assumptions. This means that Gillespie Economics’ incorrectly states that AUD\$87 per tonne was used in the economic analysis when AUD\$102 per tonne has been used (see Section 2.3). ¹
Value of Greenhouse Gas Emissions	~\$81 million (PV)		Value of greenhouse gas emission impacts increases from \$6 million to \$81 million (PV), a discrepancy of \$75 million, when correctly calculated using Gillespie Economics’ stated assumptions and peer reviewer agreed methodology (see Section 2.7)
Aboriginal Heritage Impacts	~\$45 million (PV)		Aboriginal heritage impacts were included in the 2012 analysis, but excluded in the 2015 analysis. This change, between 2012 and 2015, materially biases the economic analysis in favour of the proposed Drayton South open-cut coal mine (see Section 2.7).
Travel time costs	~\$5 million (PV)		Travel time cost are readily quantified but have been excluded from the analysis (see Section 2.7)
Non-market employment		\$146 million (PV)	The inclusion of non-market employment benefits has been roundly discredited but continues to be included (see Section 2.8).
Product tonnes over-estimated		~\$910 million (PV)	Anglo American over-estimated the size of the economic coal resource at the existing Drayton (North) mine by 15.8 million tonnes or nearly 35%. It is therefore possible that the size of the coal resource at Drayton South has also been materially over-estimated. This, in turn, would mean that the value of coal and royalty returns are materially over-estimated, so a 35% product tonne sensitivity analysis should be undertaken. If the coal resource is smaller it is possible that the variable components of the operating costs would fall and partially offset the change, but this change could not be estimated because operating costs are reported at an aggregate level (see Section 2.4).
Capital cost	~\$101 million (Nominal)		Independent review of the project capital costs has identified missing capital costs (see Section 2.6)

	Under-estimated costs	Over-estimated benefits	Comments
Other externalities	\$unknown		Independent reviews of the project have identified a number externality impacts that are not quantified, including legacy surface water and groundwater, noise, air, animal health, animal behaviour, marketing, heritage and visual impacts (see Section 2.7)

Note: Marsden Jacob has further confirmed that the assumed coal price is actually AUD\$102.35 per tonne (not AUD \$87 per tonne) by recalculating the royalty returns from the proposed Drayton South open-cut coal mine (see Figure 8).

It should be noted that Marsden Jacob was unable to check several cost and benefit items because they are only reported at an aggregate level, such as opportunity cost of land, operating cost and avoided decommissioning and rehabilitation costs. Given the issues uncovered by our review, Marsden Jacob believes it is essential that all costs and benefits are transparently reported and thoroughly checked.

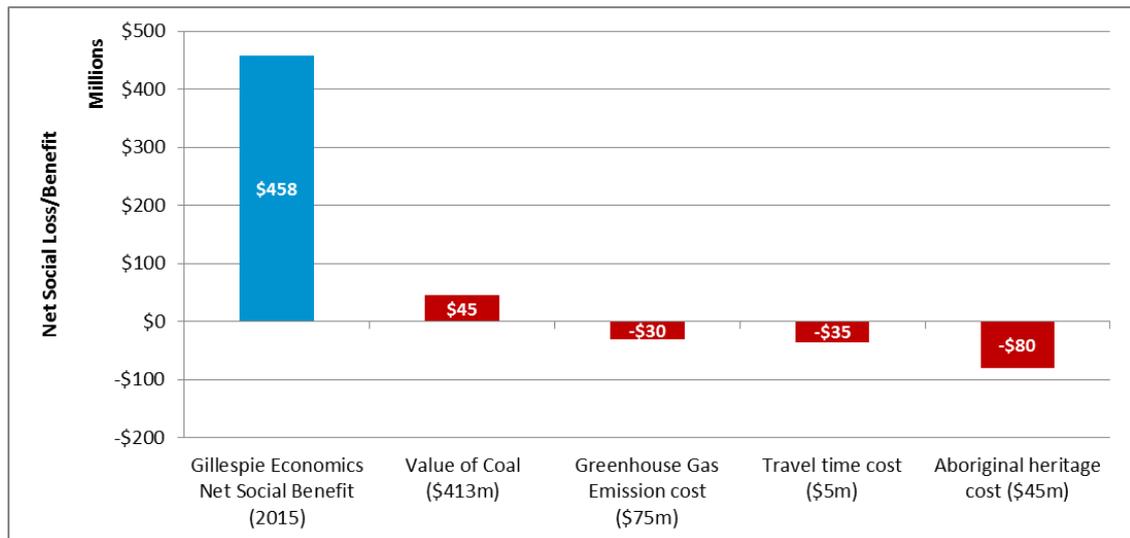
Conclusion 2: When the economic analysis is recalculated using Anglo American’s and Gillespie Economics’ assumptions the Drayton South coal mine conservatively results in a net social loss of around \$80 million (see Section 2)

The proposed Drayton South open-cut coal is not economically beneficial, even before impacts on the studs are factored into the analysis. Figure 1 illustrates that the claimed net social benefit of \$458 million (net present value) should actually be a net social loss of around \$80 million (net present value). The net social loss results from:

- revised value of coal that was recalculated based on Gillespie Economics’ and Anglo American’s stated assumptions – subtract \$413 million (present value);
- revised greenhouse gas emissions cost that was recalculated based on Gillespie Economics’ and Anglo American’s stated assumptions – subtract \$75 million (present value);
- travel time costs based on Gillespie Economics’ response to the Deloitte Access Economics review – subtract \$5 million (present value); and
- aboriginal heritage impacts based on Gillespie Economics’ (2012) – subtract \$45 million (present value).

If other production, externality and capital costs (see Conclusion 1) were also factored into the current economic analysis this will further increase the net social loss that would result if the mine is developed.

Figure 1: Net Social Benefit/Loss



Conclusion 3: The impact of the project on Coolmore Australia and Darley Australia continues to be ignored (see Section 3)

The economic assessment fails to recognise the impact of the project on Coolmore Australia and Darley Australia, their critical contribution to the Hunter Valley and NSW economies and the economic impact that would result if they were to relocate inter-state. Furthermore, it is clear that both Anglo American and the Department do not understand Coolmore Australia and Darley Australia's business models and consequently they underestimate the regional economic impact that would eventuate if they were to relocate.

Coolmore Australia and Darley Australia are premium stallion farms. Image, client perception, visual presentation and reputation are all critical components in a premium thoroughbred stud's business model. This is consistent with international best practice and can be witnessed at leading studs worldwide. For instance, based on Marsden Jacob's analysis in 2013 their average service fees were over \$40,000, nearly double the average for the Hunter Valley (\$23,413), more than treble the NSW average (\$11,507) and nearly 700% higher than the national average (\$6,110).¹ This means that their business model is materially different to both broodmare farms and most other stallion farms.

The Secretary's Environmental Assessment Reports maintains that the capital investment in their properties and proximity to the Hunter Valley are material barriers to relocation.

Coolmore Australia and Darley Australia clearly do not wish to leave the Hunter Valley.

However, it is important that the NSW Government understands that:

- earnings from stallion fees are fundamental to Coolmore Australia and Darley Australia's business viability;
- their bloodstock (stallions and mares) is valued in the hundreds of millions and this is far greater than the property values; and
- if they are forced to relocate they will take their clients and valuable bloodstock with them. They will not leave a void in the market.

¹ Australian Stud Book data from 2011.

Previous analysis by Marsden Jacob (2013) of the economic impacts on NSW and Hunter Valley region if Coolmore Australia and Darley Australia were to relocate found that:

- the direct economic loss to the NSW economy that results if Coolmore Australia and Darley Australia were to relocate to Victoria would be between \$229m (base case) and \$368m (sensitivity test), in present value terms;
- Coolmore Australia and Darley Australia directly employ up to 300 people during the breeding season in their Hunter Valley operations;
- if Coolmore Australia and Darley Australia were to relocate this would very conservatively put 640 jobs at risk in the Hunter Valley across broodmare farms, veterinary hospitals, transport, farriers, saddlers, capital equipment, hospitality, construction that are not supplying the mines; and
- if Coolmore Australia and Darley Australia were to relocate this would strip over \$120 million per annum in gross regional production from the local economy.

Finally, the minerals sector downturn is already being witnessed in the Hunter Valley with many communities and businesses being adversely impacted. If Coolmore Australia and Darley Australia are forced to relocate this will fragment the Hunter Valley's equine critical industry cluster and further amplify the vulnerability of the region to economic and climatic shocks.

Conclusion 4: The analysis does not comply with government requirements

The economic analysis does not comply with the NSW government's requirements, because:

- assumptions underlying all estimates have not been made explicit, such as capital costs, operating costs and externality impacts. NSW Treasury guidelines stipulate "*Assumptions underlying all estimates should be made explicit in the evaluation*" (TPP07-5, page 17);
- there are issues with the calculations. NSW Treasury guidelines state: "*The key to the analysis is a complete and accurate enumeration of all the costs and benefits associated with a project*" (TPP07-5, page 50). The SEARs state: "*projected economic costs and benefits of the project, including the basis for their estimation*";
- all of the negative impacts have not been included in the analysis. The supplement to the SEARs state: "*The economic and social impacts of the action, both positive and negative, must be analysed*";
- the analysis of the costs and benefits to NSW is focused on royalties, taxes and contributions. The SEARs require a detailed assessment of: "*the costs and benefits of the project, identifying whether the development as a whole would result in a net benefit to NSW*"; and
- the analysis does not pay "*particular attention to impacts on the operation and reputation of the Upper Hunter Equine and Viticulture Critical Industry Clusters and the associated tourism industry*"(SEARs). The analysis simply asserts that the Drayton South open-cut coal mine will have no impact on the viability of the neighbouring studs.

Furthermore, because the cost-benefit analysis has been undertaken from a national perspective the sensitivity analysis for NSW is predominantly showing how royalty and tax benefits to NSW change under different assumptions. There are two problems with this:

1. royalties are financial transfers between the project proponent and the NSW Government, as confirmed by the fact that the operating costs in the analysis exclude royalties (Gillespie Economics, 2015, E-33). Thus while they represent a financial gain to NSW, the economic

analysis of the project really should be focused on the net social benefit/cost of the project to NSW.

2. royalty returns are also directly linked to production tonnes and assumed coal prices, so similar to the 'value of coal' calculation (discussed earlier) the royalty returns to NSW are materially over-stated.

1. Introduction

Marsden Jacob Associates (Marsden Jacob) was engaged by Coolmore Australia and Darley Australia to review the economic assessment of the Drayton South open-cut coal mine. Marsden Jacob's review has focused on the economic viability as reported in the cost-benefit analysis, not the financial viability, of the Drayton South open-cut coal mine.

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Marsden Jacob attempted to check the computation accuracy of the entire cost-benefit analysis, but because we do not have access to the spreadsheet model and many of the assumptions are only reported as aggregate present values it was not possible to check many of the results.

1.1 Drayton South coal mine

Anglo American is seeking development approval for the Drayton South coal mine. The Drayton South coal mine involves the development of mining operations for a period of 15 years.

The project is directly across the road from, and within 1km of, Australia's largest thoroughbred stud operations, owned and operated by Darley Australia and Coolmore Australia.

1.2 Reference reports

In undertaking this peer review, Marsden Jacob has reviewed the following reports:

- Anglo American (2015) Drayton South Coal Project: Environmental Impact Statement: Main Report
- Anglo American (2015) Drayton South Coal Project: Environmental Impact Statement: Appendix B – Mine Justification Plan
- Anglo American (2015) Drayton South Coal Project: Response to Submissions
- BDA Group (2015) Drayton Mine Extension Project Economic Impact Assessment Peer Review (Environmental Impact Statement: Appendix F)
- Gillespie Economics (2012) Drayton South Coal Project – Economic Assessment (Environmental Impact Statement Appendix U)
- Gillespie Economics (2015) Drayton South Coal Project – Economic Assessment (Environmental Impact Statement: Appendix E)

- Hansen Bailey (2014) Drayton South Coal Project – Consequential Environmental Impact Assessment for Retracted Mine Plan
- NSW Government Planning and Environment (2015) State Significant Development Drayton South Coal Project: Secretary’s Environmental Assessment Report
- NSW Government Planning and Environment (2015) State Significant Development Drayton South Coal Project: Secretary’s Environmental Assessment Report
- NSW Government Planning and Environment (2015) State Significant Development Drayton South Coal Project: Secretary’s Environmental Assessment Report (Appendix H – Economics Peer Review by Deloitte Access Economics)

Marsden Jacob has undertaken a high level review of the submissions and responses to submission that have been made on this and previous Drayton South projects.

Marsden Jacob has also drawn upon the results of the following study: Marsden Jacob Associates (2013) Economic impact of the proposed Drayton South Open-cut Coal Mine development on the Hunter Valley Thoroughbred Industry.

1.3 Report Structure

This review report is structured as follows:

- Section 2: Conclusions 1 and 2 – Drayton South is not economically beneficial
- Section 3: Conclusion 3 – Coolmore Australia and Darley Australia’s regional importance
- Section 4: Conclusion 4 – The analysis does not comply with the SEARs and NSW Treasury guidelines

2. Conclusions 1 and 2: Drayton South is not economically beneficial

In this section Marsden Jacob presents the results of the review of the economic merit of the Drayton South open-cut coal mine. Marsden Jacob’s review has focused on whether the Drayton South coal mine is economically beneficial (results in a net social benefit), as reported in the cost-benefit analysis section of the Gillespie Economics report. Marsden Jacob has not assessed the financial viability of the Drayton South coal mine.

Conclusion 1: *The economic analysis over-estimates the net social benefit of the proposed mine by at least \$538 million, even before other costs such as capital, production tonnages and impacts on the neighbouring studs are factored into the analysis.*

The economic analysis of the proposed Drayton South open-cut coal mine needs to assess the full range of costs and benefits in a balanced, detailed and demonstrably unbiased manner.

Marsden Jacob’s review of the Drayton South open-cut coal mine economic analysis has identified that net social benefit of the proposed mine is over-estimated by at least \$538 million (present value). Furthermore, this reduction in the net social benefit is conservative because it only factors in changes to the value of coal, value of greenhouse gas emissions, aboriginal heritage and travel time.

The reduction in the net social benefit could be significantly higher (see Table 2) if other costs were included, such as: missing capital costs (approximately \$40-50 million); impacts that would result if product tonnes are over-estimated (close to \$1 billion) and state impacts that emerge if Coolmore Australia and Darley Australia are forced to relocate interstate (up to \$368 million). In summary, Marsden Jacob’s review identifies that benefits and costs have potentially been misestimated by around \$1.5 billion (PV).

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Travel time costs	~\$5 million (PV)		Travel time cost are readily quantified but have been excluded from the analysis (see Section 2.7)
Non-market employment		\$146 million (PV)	The inclusion of non-market employment benefits has been roundly discredited but continues to be included (see Section 2.8).
Product tonnes over-estimated		~\$910 million (PV)	Anglo American over-estimated the size of the economic coal resource at the existing Drayton (North) mine by 15.8 million tonnes or nearly 35%. It is therefore possible that the size of the coal resource at Drayton South has also been materially over-estimated. This, in turn, would mean that the value of coal and royalty returns are materially over-estimated, so a 35% product tonne sensitivity analysis should be undertaken. If the coal resource is smaller it is possible that the variable components of the operating costs would fall and partially offset the change, but this change could not be estimated because operating costs are reported at an aggregate level (see Section 2.4).
Capital cost	~\$101 million (Nominal)		Independent review of the project capital costs has identified missing capital costs (see Section 2.6)
Other externalities	\$unknown		Independent reviews of the project have identified a number externality impacts that are not quantified, including legacy surface water and groundwater, noise, air, animal health, animal behaviour, marketing, heritage and visual impacts (see Section 2.7)

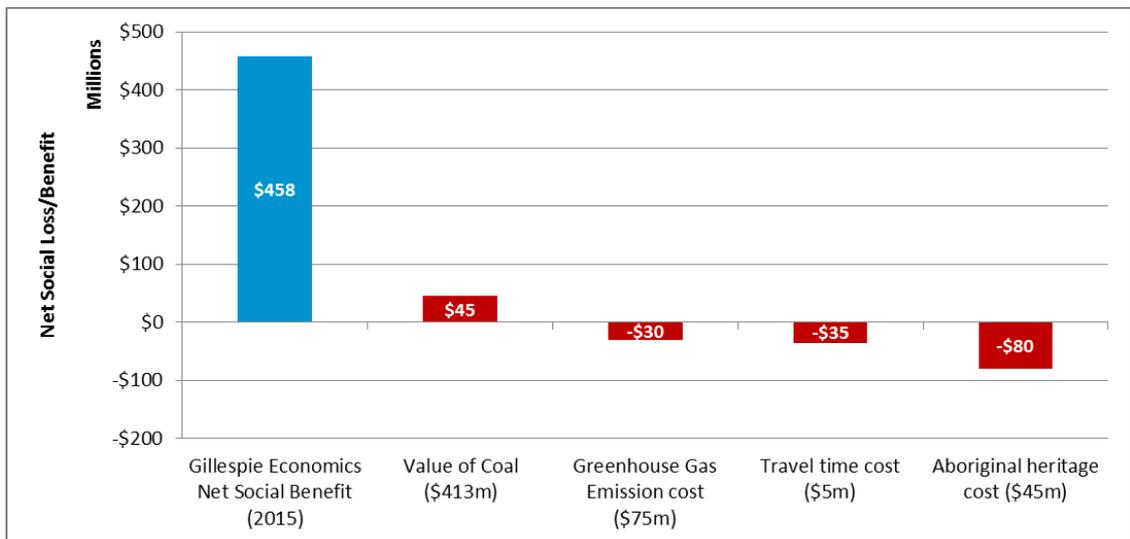
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- travel time costs based on Gillespie Economics’ response to the Deloitte Access Economics review – subtract \$5 million (present value); and
- aboriginal heritage impacts based on Gillespie Economics’ (2012) – subtract \$45 million (present value).

If other production, externality and capital costs (see Conclusion 1) were also factored into the current economic analysis this will further increase the net social loss that would result if the mine is developed.

Figure 2: Net Social Benefit/Loss



The economic impact for NSW and the Hunter Valley region could be even more pronounced if the Drayton South open-cut coal mine is developed and Coolmore Australia and Darley Australia are forced to relocate. In 2013, Marsden Jacob analysed the direct economic loss to the NSW economy that results from Coolmore Australia and Darley Australia relocating to Victoria is between \$229 m (base case) and \$368 m (sensitivity test), in net present value terms.

2.1 Why are the results of the economic analysis important?

In this review Marsden Jacob has focused on the cost-benefit analysis of the proposed Drayton South open-cut coal mine, because it is a key decision source to inform NSW Government decision-making.

Cost-benefit analysis is an analytical technique that should consider on a consistent basis the benefits and costs of alternatives. If completed in a robust and unbiased manner, cost-benefit analysis enables the comparison of alternative options in comparable terms.

The cost-benefit analysis is important because the SEARs require that Anglo American undertake a “*Social and Economic*” assessment that includes:

- “a detailed assessment of the likely social impacts of the development on the local and regional community, paying particular attention to impacts on the operation and reputation

of the Upper Hunter Equine and Viticulture Critical Industry Clusters and the associated tourism industry; and

- *a detailed assessment of the likely economic impacts of the development, paying particular attention to:

 - *the costs and benefits of the project, identifying whether the development as a whole would result in a net benefit to NSW, including consideration of fluctuations in commodity markets and exchange rates; and*
 - *the demand for the provision of local infrastructure and services, having regard to Muswellbrook Shire Council's requirements”.**

And, the supplement to the SEARs (Section 7) requires that:

“The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest include:

- a) details of any public consultation activities undertaken, and their outcomes;*
- b) details of any consultation with Indigenous stakeholders.*
- c) projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies;*
- d) employment opportunities expected to be generated by the project (including construction and operational phases).*

Economic and social impacts should be considered at the local, regional and national levels. Details of the relevant cost and benefits of alternative options to the proposed action, as identified in Section 4 above, should also be included.

Identification of affected parties is required, including a statement mentioning any communities that may be affected and describing their views.”

2.2 Proponent's claimed economic benefit

The Gillespie Economics (April 2015) Drayton South Coal Project Economic Assessment claims that the development of the mine will result in a net social benefit of \$458 million (present value at 7% discount rate), see Table 3.

Table 3: Gillespie Economic Results

	Costs		Benefits	
	Description	Present Value (\$m)	Description	Present Value (\$m)
Production	Opportunity cost of land	\$13	Avoided decommissioning and rehabilitation costs by end 2015	\$62
	Opportunity cost of capital	\$50	Value of the coal	\$2,999
	Development costs	\$107	Residual value of capital	\$0
	Operating cost (ex royalties)	\$2,406	Residual value of land	\$0
	Decommissioning and Rehabilitation costs	\$21		
	Sub-Total	\$2,597	Sub-Total	\$3,061
	Net Production Benefits - Global			\$464
	Net Production Benefits - Australia (royalty and tax payments)			\$330
Environmental, Social and Cultural Impacts	Greenhouse gas impacts (global)	\$6	Non-market value of employment	\$146
	Agricultural impacts	Included in the opportunity cost of land and capital costs		
	Noise impacts	Nil		
	Blasting	Nil		
	Air quality	Nil		
	Surface water	\$1		
	Groundwater	\$0		
	Ecology	Biodiversity offset in capital and operating costs		
	Road Transport impacts	Realignment included in capital costs		
	Aboriginal heritage	Not quantified		
	Non-Aboriginal heritage	Nil		
	Visual impacts	Mitigation costs included in the capital costs		
	Sub-Total	\$7 (\$1)		\$146
	Net Social Benefits - including employment benefits			
Net Social Benefits - excluding employment benefits				\$458 (\$329)

Note: bracketed value are attributed to Australia in the cost-benefit analysis

2.3 Over-estimated benefits: Value of coal

Marsden Jacob’s analysis concludes that the value of coal is over-estimated by around \$413 million (present value at 7% discount rate) and this value could be higher subject to sensitivity testing around the production schedule.

The value of coal is fundamental to assessing whether the Drayton South open-cut coal mine is economically beneficial. The value of coal is important because it represents over 90% of the

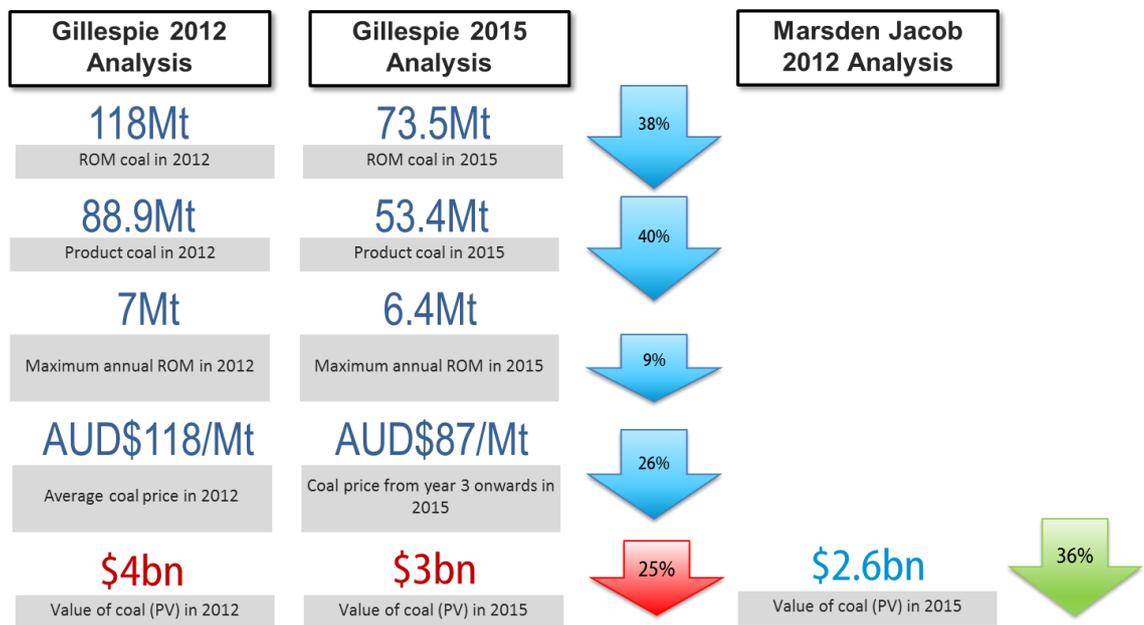
benefits in the economic analysis of the proposed Drayton South Coal Mine. It is also fundamental to estimating the royalties to be paid to the NSW Government.

2.3.1 How has the Value of Coal changed between 2012 and 2015?

Marsden Jacob reviewed how the value of coal has changed in Gillespie Economics analysis between 2012 and 2015. This revealed that the value of coal, in present value terms, has reduced by 25%, from \$4,046 million (2012) to \$2,999 million (2015). This value reduction is surprisingly small, particularly when you consider that the:

- product (saleable) coal tonnage has fallen by 40%; and
- assumed coal price has fallen by 26% (see Figure 3).

Figure 3: Value of Coal



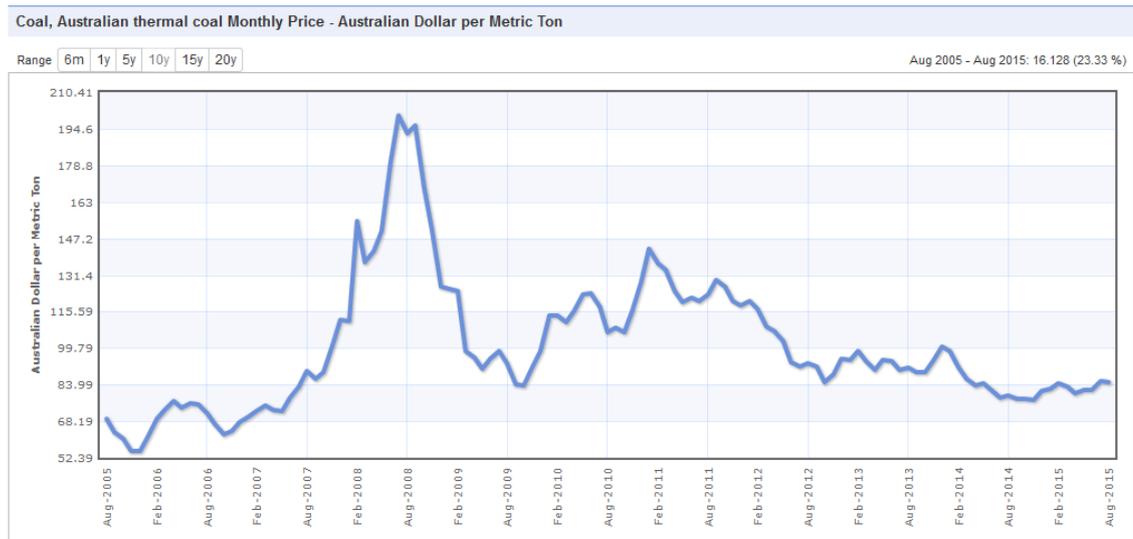
Source: Marsden Jacob analysis, 2015

2.3.2 Benchmark coal

Thermal coal is a heterogeneous commodity that can have different quality specifications and these quality specifications affect its market value. Gillespie Economic and Deloitte Access Economic (2015) confirm that “all of the product coal is expected to have low ash content and is consequently of benchmark quality”. This means that the price path for coal from Drayton South should reflect benchmark thermal coal prices.

Figure 4 details the Newcastle FOB thermal coal price over the past ten years. This figure confirms that thermal coal prices have declined significantly since the peaks witnessed in 2008 and 2011. Thermal coal is currently trading for around AUD \$80-85 per metric tonne.

Figure 4: Australian thermal coal monthly price



Source: *Indexmundi*

2.3.3 Value of Coal in present value terms is a function of the assumed coal prices and coal production schedule

The value of coal (in present value terms) is a function of the assumed coal prices, coal production schedule and discount rate. The discount rate has not changed, so the only possible explanations for the disproportionate reduction in the value of coal are:

- a different coal price has been used in the economic modelling; or
- the production schedule has been accelerated.

Because the coal production schedule has not increased (the maximum ROM tonnes has been reduced by 9%, see Figure 3) this means a different coal price must have been used in the modelling.

Coal Prices

Gillespie Economics (2015) states that the coal prices used in the economic analysis and royalty calculations are:

- USD\$72/t in 2016;
- USD\$82/t in 2017; and
- AUD\$87/t thereafter (pages 25, 56 and 61).

The AUD/USD exchange rate is assumed by Gillespie Economics to be 0.85.

Furthermore, Anglo American’s Response to Submissions (2015) states that: “The longer term coal price used for the EIS Economic Assessment of A\$87/t equates to around US\$65/t at the current exchange rate. This is only 7% higher than current spot of US\$61/t.” (page 109).

Based on our review of publically available coal forecasts, these assumed coal prices while higher than many forecasts appear to be justifiable for the purpose of this analysis:

- Gillespie Economics: “Projected prices for the Project product thermal coal were provided by Anglo American and are based on the average of the December 2014 Consensus Pricing

from 21 financial institutions (UBS, 2014). The assumed price is USD\$72/t in 2016, USD\$82/t in 2017 and AUD\$87/t thereafter”. (2015, E-25)

- Secretary’s Environmental Assessment Report: “NSW Trade & Investment, which forecasts that the medium and long term export thermal coal price is likely to be between US\$67 and US\$88 a tonne (assuming an AUD/USD exchange rate of 0.75)”. (2015, p47)
- Deloitte Access Economics has previously modelled a second scenario “based (on) \$74 (AUD) a tonne, equivalent to the long term average coal price (World Bank 2012).” (2013, p28)
- Deloitte Access Economics (2015) commented that the assumed coal prices should be updated to reflect recent changes in prices and exchange rates. However, Deloitte’s comments focus on the short-run prices whereas long-run prices are actually more important for this cost-benefit analysis.

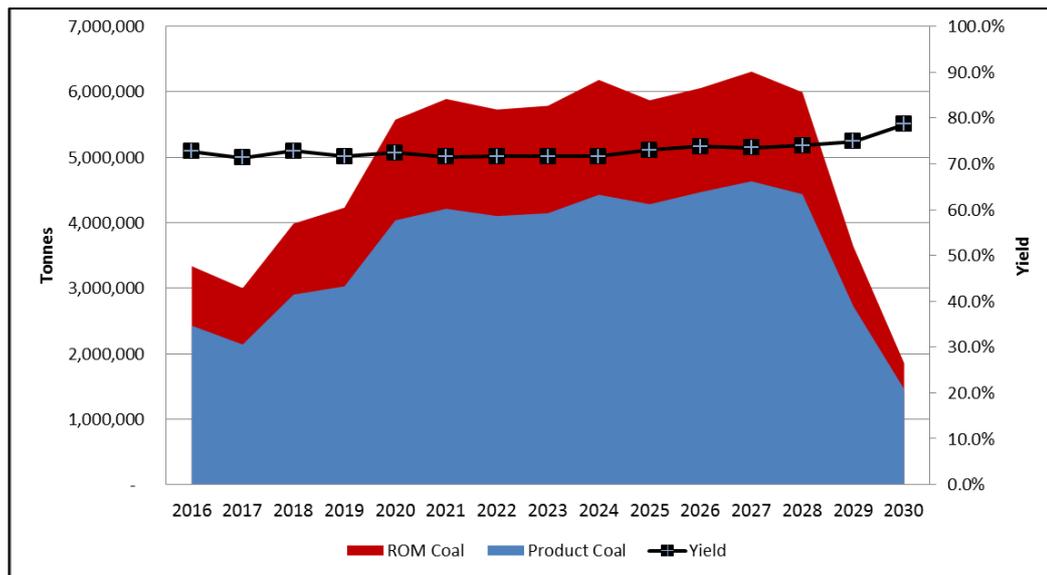
Marsden Jacob requests that a copy of the consensus pricing cited by Gillespie Economics (2015) be provided to confirm that conservative price estimates have been used in the analysis. We note the report has previously been requested by the Hunter Thoroughbred Breeders Association and Marsden Jacob request it again because it is critical to transparency.

Finally, Marsden Jacob notes that the Secretary’s Assessment Report confuses AUD (Australian Dollars) and USD (US Dollars) where the assumed coal prices in the economic analysis are concerned. The report mistakenly states that the assumed coal price from year three onwards is “US \$87 a tonne” (pages 20 and 47), when the assumed coal price is actually AUD \$87 per tonne as per Gillespie Economics (2015).

Coal Production Schedule

Anglo American clearly specifies the annual coal production schedule in Table 4 of the Mine Justification Plan (2015), see Figure 5.

Figure 5: ROM and Product Coal Schedule



Source: Anglo American (2015) Drayton South Coal Project: Environmental Impact Statement: Appendix B – Mine Justification Plan

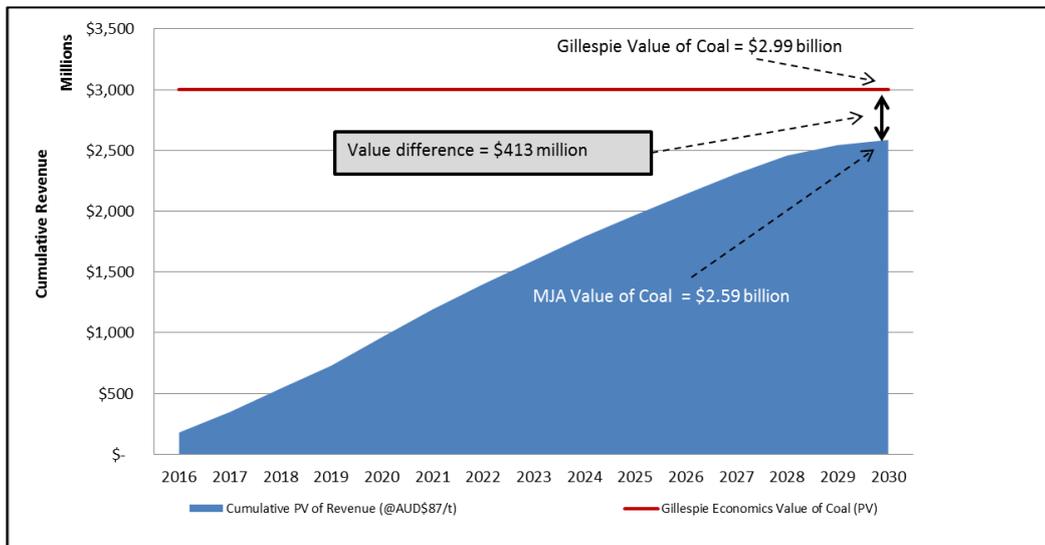
2.3.4 Value of Coal: Present Value is over-estimated

Based on the coal price, production schedule and discount rate information provided by Anglo American, Marsden Jacob has recalculated the value of coal.

Not surprisingly, given key inputs to this calculation have changed by between 26% (coal price) and 40% (product coal tonnes) **Marsden Jacob finds that the value of coal should be \$2,586 million** (present value at 7% discount rate), **not \$2,999 million** (present value at 7% discount rate). This means the value of coal:

- has been over-estimated by \$413 million (see Figure 6); and
- when compared to 2012 (\$4,046 million) the value of coal now falls by 36%.

Figure 6: Value of Coal at AUD\$87/t, present value at 7% discount rate



Source: Marsden Jacob, 2015, see Attachment A for more detail on this calculation

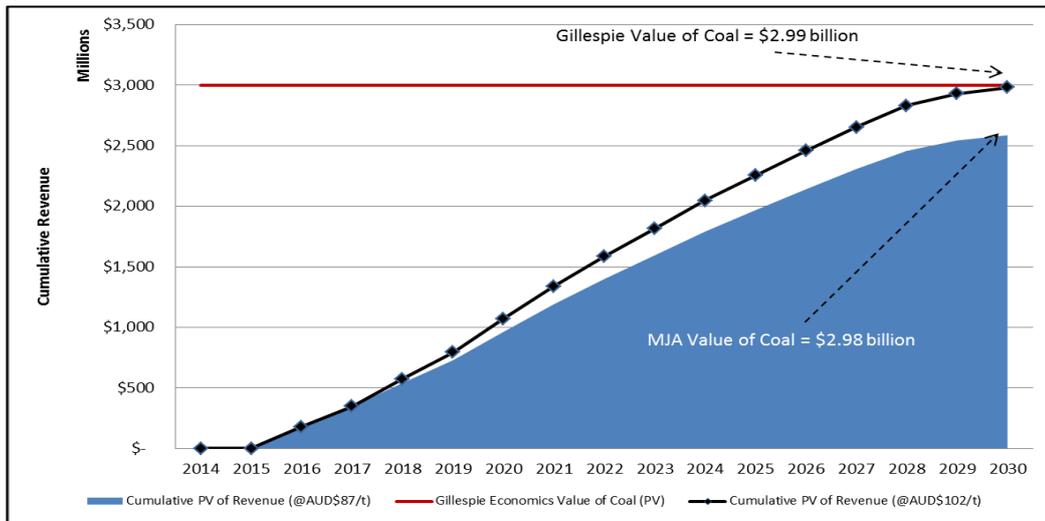
2.3.5 Value of Coal: The assumed coal price appears to be AUD \$102/t (USD\$87/t)

So what price has been assumed in the Gillespie Economics analysis? In Marsden Jacob’s view Gillespie Economics’ incorrectly states that AUD\$87 per tonne was used in the economic analysis when AUD\$102 per tonne has been used.

When this coal price is used, from year three onwards, the value of coal (in present value terms) is \$2,981 million which is very close to the \$2,999 million reported in Gillespie Economics and any difference (~0.6%) can be explained by rounding error, see Figure 7.

This alternative coal price was selected because it equates to US\$87/t at Gillespie’s assumed exchange rate of 0.85 (AUD/USD).

Figure 7: Value of Coal at AUD\$102/t (USD\$87/t), present value at 7% discount rate



Source: Marsden Jacob analysis, 2015

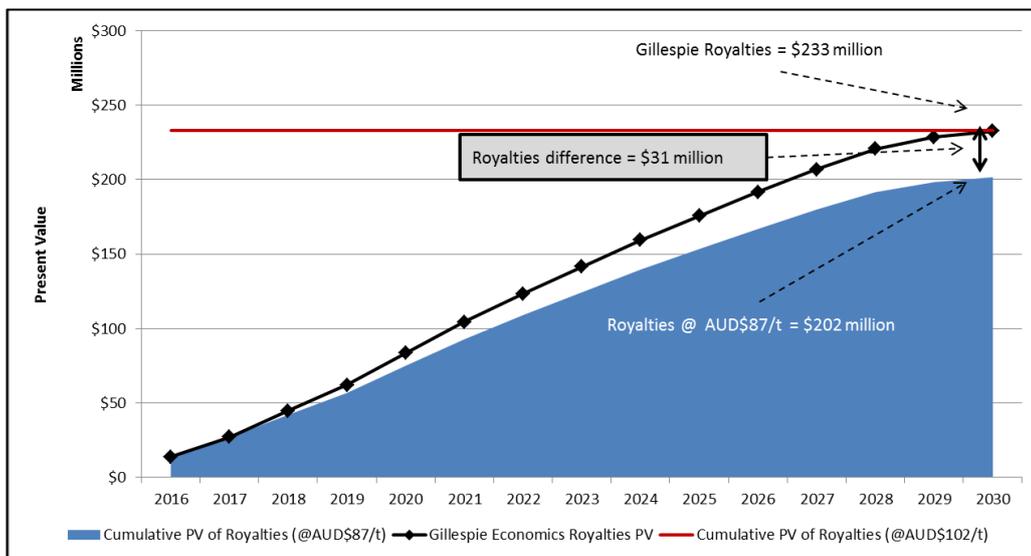
Note: The very small difference in the present value (0.6%) can be explained by rounding errors in the information provided in the EIS.

Royalties: Confirms that the assumed coal price appears to be AUD \$102/t (USD\$87/t)

This finding is also confirmed for the present value of royalties. This is important, because the present value of royalties from the proposed mine is also a function of the production schedule, coal prices and discount rate.

Gillespie Economics and Anglo American claim that the Drayton South open-cut coal mine will result in royalty payments of \$233 million (present value at 7% discount rate). However, when the present value of royalties is recalculated using Anglo American’s and Gillespie Economics’ stated assumption the present value is only \$202 million (at 7% discount rate), a shortfall of \$31 million. **The claimed present value of royalties is only achieved when the coal prices is assumed to be AUD\$102.35/t**, see Figure 8.

Figure 8: Royalties at AUD\$87/t and AUD\$102/t, present value at 7% discount rate



Source: Marsden Jacob, 2015

Marsden Jacob also notes that in the Drayton South Environmental Impact Statement report states that average annual royalty payments remain unchanged (~\$30 million per annum) in both the 2012 analysis to the 2015 analysis. This claim is illogical because royalties are an ad valorem tax (see Box 1). **Given the coal price has fallen by 26% and the production schedule has not increased the average annual royalty payment must also fall by at least this amount.**

Box 1: Ad Valorem royalty

Mineral resources in NSW are mostly owned by the Crown and royalties are charged for their extraction because they are a public asset that is depletable.

Royalty for coal is charged as a percentage of the value of production (total revenue less allowable deductions)¹.

Section 44 of the *Mining Regulation 2003* (NSW) states that “the base rate of royalty for coal is as follows:

- (a) 8.2% of the value of coal recovered by open cut mining,
- (b) 7.2% of the value of coal recovered by underground mining,
- (c) 6.2% of the value of coal recovered by deep underground mining.”

Source: NSW Trade and Investment, www.resourcesandenergy.nsw.gov.au/miners-and-explorers/compliance-and-reporting/royalties

2.4 Over-estimates the benefits: Production schedule

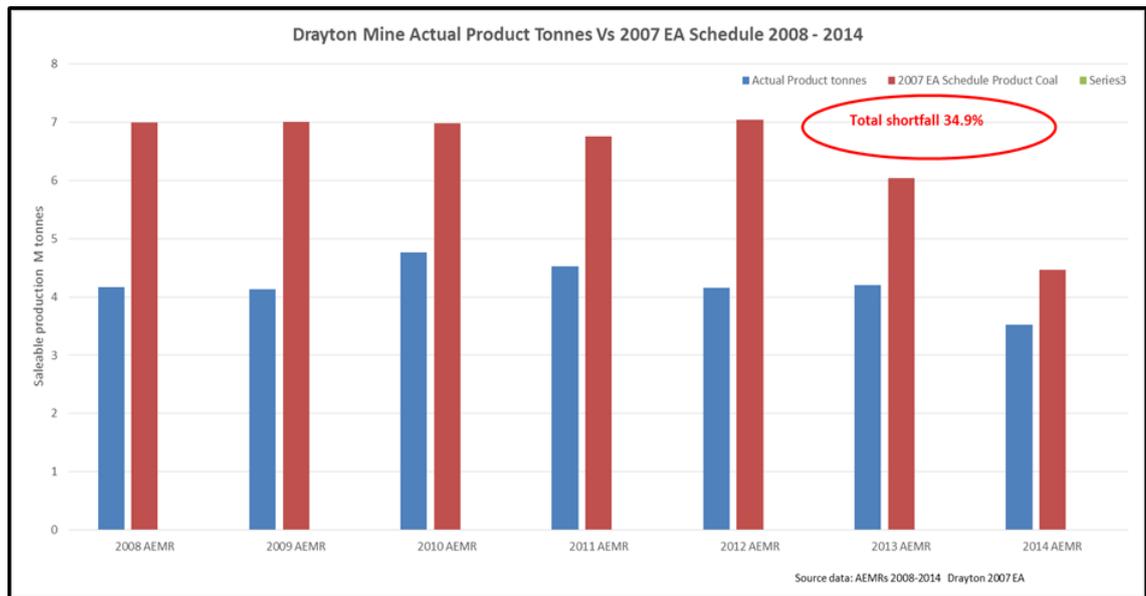
White M (2015) Review of Key Mining Issues: Drayton South Coal Project identifies that from 2008 to 2014 at the existing Drayton coal mine “actual saleable production was significantly less than the schedule provided in the 2007 EA. The total shortfall in that period was 15.8 million product tonnes or 34.9%. This shortfall occurred during a period of peak and sustained high coal prices when mine operators had strong economic incentive to maximise production levels”, see Figure 9.

Where did this coal go? White M (2015) comments that: “Based on the above information 13.5 million ROM tonnes of reserves were “lost” over the period 2007-2014. This represents both a significant loss in asset value for Anglo and the non-realisation of expected royalties for the State of New South Wales from the coal tonnes that were not produced”.

As a result, it appears that **Anglo American over-estimated the size of the economic coal resource at the existing Drayton mine.** It is therefore possible that the size of the coal resource at Drayton South has also been materially over-estimated. This, in turn, could mean that the revenue from coal and royalty returns are materially over-estimated in the Drayton South cost-benefit and regional analysis.

It is therefore critical that the economic analysis for the Drayton South open-cut coal mine include a sensitivity analysis that considers the economic merit of the proposed coal mine if the product tonnes are over-estimated by 35%. This is important, because this change **could reduce the value of coal estimate by 35%, or over \$910 million** (present value), based on Marsden Jacob’s re-estimated value of coal of \$2,586 million.

Figure 9: Drayton Mine Actual Product Tonnes vs 2007 EA Schedule



Source: White M (2015) Review of Key Mining Issues: Drayton South Coal Project

If the mined coal resource is smaller the variable components of the operating costs for Drayton South could fall and partially offset this change, but it was not possible to estimate the change because operating costs are reported at an aggregate level in the economic analysis.

2.5 Over-estimated benefits: Avoided decommissioning and rehabilitation, and non-market employment benefits

Our review has identified that a number of other **benefits appear to have been over-estimated or have materially increased with no clear justification**. To highlight the issues the following discusses:

- Avoided rehabilitation and decommissioning costs; and
- Non-market employment benefits.

2.5.1 Avoided rehabilitation and decommissioning costs

Despite extracting a smaller amount of coal over a shorter period of time, than the previously proposed Drayton South open-cut coal mine, the rehabilitation and decommissioning cost has increased from \$32 million (2012) to \$66 million (2015) in nominal terms.

In present value terms this means the avoided cost associated with decommissioning and rehabilitating the existing Drayton North and new Drayton South mine has increased by 140%, from \$17 million (present value) to \$41 million (present value).

Not only is there no breakdown of the decommissioning and rehabilitation cost, but there is no justification for the very significant increase in this avoided cost. Highlighting the reporting deficiency, the only detail provided in the Gillespie Economics' analysis is: *"At the end of the Project life, the mine site will begin to be decommissioned and rehabilitated at an estimated cost of \$66M"* (page E-25).

2.5.2 Non-market employment benefits

The Gillespie Economics analysis **continues to include non-market employment benefits in the analysis**. Non-market unemployment benefits must be excluded from the cost-benefit analysis.

The inclusion of non-market employment benefits has been roundly criticised by the NSW Land and Environment Court and NSW Planning Assessment Commission reviews of similar projects (see Wallarah 2 and Stratford Extension). For instance, previous Planning Assessment Commission reviews have found that the inclusion of non-market employment benefits is: “*thoroughly discredited*” (Walarah 2 Planning Assessment Commission) or “*of doubtful validity*” (Stratford Extension Planning Assessment Commission).

Furthermore, economic theory and empirical evidence states that non-market employment benefits should only be included in cost-benefit analysis if labour resources used in the project would otherwise be unemployed. There is no evidence in the economic assessment report that the labour resources would be unable to find alternative employment. Additionally, the Bureau of Resource and Energy Economics’ publication Resources and Energy Major Projects (2014) identifies that there are several expansion or new mines proposed to be developed in the region.

2.6 Under-estimates the costs: Capital cost

In the 2015 economic assessment the life of project capital costs are \$131 million (\$107 million present value). This means the project capital cost has fallen by \$354 million from the 2012 economic assessment when the capital cost was \$485 million.

The EIS attributes part of this capital reduction to extending the lives of existing equipment and buying second hand replacement equipment at reduced capital cost (compared to buying new equipment).

White M (2015) comments that: “*While these are valid ways to reduce capital spend, there is a trade-off in that this strategy will incur additional operating (maintenance) costs and will increase the likelihood of lower than planned equipment reliability and availability. This increased equipment downtime reduces the annual production capacity of effected equipment.*”

White M (2015) also comments that the life of mine capital cost appears to have been under-estimated and conservatively commented that around “*\$101 million*” in additional capital items may be needed by the mine, because: “*New mining equipment does not appear to be accounted for, and the EIS document states that existing mining equipment will be utilised for the Drayton South Project. The bulk of equipment to be used for the Drayton South project is not new, and will require ongoing replacements over the life of the project if it is to operate effectively and efficiently. This would likely be required across a full range of equipment from excavators and trucks, dozers, light trucks and light vehicles right down to minor capital items including pumps, welders, generators and tools.*”

As a result it appears that the capital costs have been under-estimated. This is important because **if the capital cost are actually higher, than those included in the current cost-benefit analysis, this will further increase the net social loss that would result if the mine is developed**. Equally, based on White M (2015) it may be that the operating costs have be under-estimated.

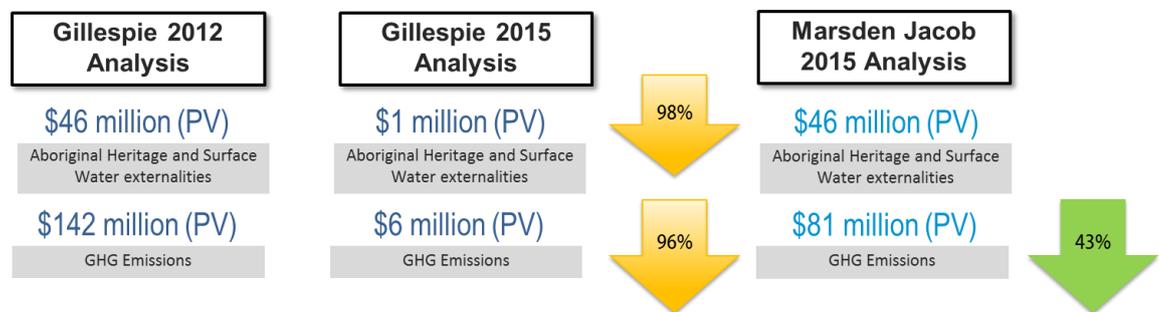
2.7 Under-estimates the costs: Externality impacts

Development of the Drayton South open-cut coal mine will result in a number of negative externality impacts. A negative externality is a cost that is imposed on a third party as a result of the economic development or transaction. Externalities are also referred to as spill over effects and negative externalities are also referred to as external costs. External costs are important because as the NSW Treasury economic appraisal guidelines state: “external costs and benefits must be taken into account” (page 11).

It is noteworthy that very few of the external costs have been valued in the 2015 analysis, for those which have been valued they have fallen by extremely significant amounts between 2012 and 2015. For instance, the cost of:

- aboriginal heritage and surface water impacts has reduced by 98% or \$45 million; and
- greenhouse gas emissions has reduced by 96% or \$136 million (see Figure 10).

Figure 10: Externality Impacts, present value



Source: Marsden Jacob, 2015

This leads to two key questions: Why have externality impacts from the Drayton South coal mine decreased so significantly? And, why are other externality impacts not valued in the Gillespie Economics analysis?

2.7.1 Aboriginal heritage costs

As Veale S (2015) identifies there are significant aboriginal (and non-aboriginal) heritage values on the site of the Drayton South open-cut coal mine, and the land is currently the subject of a native title claim.

In 2012, Gillespie Economics stated that “the Project has the potential to impact Aboriginal heritage sites in Project land disturbance areas”, consequently, Gillespie Economics estimate the value of Aboriginal heritage impacts at \$45 million present value (at 7% discount rate), page 16.

In 2015, Gillespie Economics does not value the Aboriginal heritage impacts and instead states that “Any impacts on Aboriginal heritage sites may impact the well-being of the Aboriginal community. However, monetisation of these impacts is problematic and so these impacts are best left to consideration as part of the preparation of the Aboriginal Cultural Heritage Management Plan” (page E-30).

This change, between 2012 and 2015, materially biases the economic analysis in favour of the proposed Drayton South open-cut coal mine.

2.7.2 Value of greenhouse gas emissions

Gillespie Economics' incorrectly attributes only 1% of the greenhouse gas emissions cost to Australia. This means that in Gillespie Economics (2015) greenhouse gas emissions from an Australian perspective are valued at \$0.23/t of CO_{2-e}.

Anglo American's peer reviewer (BDA Group) and the Department's peer reviewer (Deloitte Access Economics) disagree with this approach and yet Gillespie Economics has refused to change the greenhouse gas valuation methodology:

- BDA Group (Internal Peer Review, 2015): *"It is reasonable to assume that Australia will act to meet an agreed greenhouse gas reduction target ... the order-of-magnitude of such costs by marginal projects is probably also around the \$23/t mark. This implies the \$6m cost attributable at the global level by Gillespie Economics should also be attributable at the national level."*
- Deloitte Access Economics (NSW Government Peer Review, 2015): *"We agree with the internal peer review (BDA Group 2015) that the approach of scaling the Greenhouse gas impact by Australia's share of global GDP is inappropriate"*.

Marsden Jacob has also consulted with Emeritus Professor Harry Campbell from the University of Queensland, School of Economics on this matter. Emeritus Professor Campbell confirmed that Gillespie Economics' approach to valuing greenhouse gas emissions is not appropriate and the value of greenhouse gas emissions should be attributed to Australia.

Consequently, in Marsden Jacob's opinion the full cost of the greenhouse gas emissions from the Drayton South open-cut coal mine should be attributed to Australia in the analysis.

Furthermore, based on the information provided in Gillespie Economics (2015) it appears that there is a calculation error, because the present value of greenhouse gas emissions should be around \$81 million (at 7% discount rate) not \$6 million, see Table 4.

Table 4: Greenhouse Gas calculation

	2012	2015
GHG emissions (over 15 years)	11.5 Mt of CO _{2-e}	6.2 Mt of CO _{2-e}
Value of GHG emissions	\$23/t of CO _{2-e}	\$23/t of CO _{2-e}
TOTAL (undiscounted value)	\$265 million	\$142 million
Present Value (15 years @ 7% discount rate)	\$142 million	\$81 million (not \$6 million)

Sources: 1. Gillespie Economics (2012) Drayton South Coal Project – Economic Assessment (Environmental Impact Statement Appendix U), Gillespie Economics (2015) Drayton South Coal Project – Economic Assessment (Environmental Impact Statement: Appendix F)

2.7.3 Travel time costs

Marsden Jacob questions why travel time costs for users of Edderton Rd that are readily quantifiable have been excluded by Gillespie Economics?

Deloitte Access Economics (2015) also questioned their exclusion and in response Gillespie Economics commented that the proposed re-alignment of Edderton Rd will result in a “5km increase in travel distance (4 minute travel time) for those travelling from the east (~523 trips per day) and 5km decrease in travel distance (4 minute travel time) for those travelling from the west (~107 trips per day)”, based on this Gillespie Economics estimated that the “net costs from the intersection relocation in perpetuity (keeping vehicle movements fixed) is estimated at in the order of \$5M present value (at 7% discount rate)”. (Deloitte Access Economics review, 2015, page 28)

This confirms that this travel cost is readily quantifiable and so it should have been included in the cost-benefit analysis.

2.7.4 Other externalities

Expert reviews by noise, air, animal health, animal behaviour, marketing, heritage and visual professionals have identified that the two studs will be adversely impacted if the Drayton South open-cut coal mine is developed.

2.7.5 Impact on NSW if Coolmore and Darley are forced to relocate

Coolmore Australia and Darley Australia are critical players in the Hunter Valley thoroughbred cluster because they are the largest international scale thoroughbred studs in Australia (in both physical scale and market share), see Table 5: . These two studs alone constitute the epicentre of Australia’s and NSW’s thoroughbred breeding industry and any impacts on their business operations will impact all other related and support services. A fact that is confirmed by NSW Department of Trade and Investment in 2014: “the Coolmore and Woodlands (Darley) thoroughbred stud enterprises are pivotal (core businesses) to the sustainability of the Upper Hunter Equine Critical Industry Cluster and should be protected.”

As Michael Ford, Keeper of the Australian Stud Book (former), has stated when he was interviewed by Marsden Jacob: “The stand-out fact is that Coolmore and Darley produce 40% of the estimated income earned in Australia, while the Hunter Valley produces 74% leaving only 2% for the rest of New South Wales, and 24% for all the other states” (27 March 2013).

Table 5: Australian Stud Book data on Coolmore Australia and Darley Australia, 2011

	Coolmore & Darley	% of Hunter Valley	% of NSW
Stallions covering mares	30	28.8%	12.6%
Mares covered	3,419	40.1%	32.7%
Live foals	2,249	40.4%	33.7%
Average service fee	\$40,828	-	-
Estimated income from service fees	\$99.6M	53.8%	52.5%

Source: Australian Stud Book 2011

If Drayton South open-cut coal mine is developed, and Coolmore Australia and Darley Australia are forced to move from NSW to Victoria they would leave a void in the market that cannot be filled by other industry participants, because Coolmore Australia and Darley Australia would take their bloodstock and clients with them.

In 2013, Marsden Jacob analysed the direct economic loss to the NSW economy that results from Coolmore Australia and Darley Australia relocating to Victoria is between \$229 m (base case) and \$368 m (sensitivity test), in net present value terms.

2.8 These issues are not new

Many of the issues identified in Marsden Jacob’s review are not new. The same issues have emerged and been the subject of serious and sustained criticism from the judiciary, public authorities, other economists and the Planning Assessment Commission (PAC), for instance:

- Chief Judge Preston (2013) *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited*, NSWLEC 48;
- NSW Planning Assessment Commission (2014) *Stratford Extension Project Review Report*; and
- NSW Planning Assessment Commission (2014) *Wallarrah 2 Coal Project Review Report*

Their key conclusions include:

- **CJ Preston:** *“I am not satisfied that the economic analyses provided on behalf of Warkworth support the conclusion urged by both Warkworth and the Minister, namely that the economic benefits of the Project outweigh the environmental, social and other costs.”*
- **CJ Preston:** *“Having regard to the limitations of the economic analyses ... I am of the view that the results of those analyses are of limited value in deciding whether I can reach a state of satisfaction as to the nature and extent of impacts in considering each and all of the relevant matters, the weight I should assign to each matter, and the balancing of the matters, to determine whether the Project should be approved or disapproved.”*
- **Stratford PAC:** *“The economic value of the project as described in the EIS and in subsequent documentation provided by the Proponent is not credible.”*
- **Wallarrah 2 PAC:** *“In considering the merits of the project as a whole the Commission has found that the benefits claimed for the project by the Proponent (and largely adopted by the Department’s Preliminary Assessment Report) are not credible.”*

Despite clear and sustained criticism the analysis of the Drayton South open-cut coal mine further demonstrates Anglo American and Gillespie Economics’ unwillingness to respond to the criticisms and produce a detailed analysis that assesses the full range of costs and benefits in a balanced, detailed and demonstrably unbiased manner.

Consequently, Marsden Jacob is of the opinion that a review or consent authority cannot rely on this economic analysis as the basis for this decision.

3. Conclusion 3: Coolmore and Darley's regional importance

The Hunter Valley is the capital of Australia's thoroughbred breeding operations and is recognised as one of only three International Centres of Thoroughbred Breeding Excellence. The Hunter Valley thoroughbred breeding industry is a critical source of:

- Employment: stallion farms, broodmare farms and sophisticated local network of support and supply businesses. These businesses would not be based in the Hunter Valley without the breeders in the Hunter Valley;
- Racing and breeding industry: nationally, the Australian racing industry has 231,700 employees and participants, and 381 clubs which conduct 19,168 races each year. These clubs produce \$5 billion in gross domestic product per annum; and
- Export income: the Hunter Valley is the largest exporter of premium thoroughbreds and the market is forecast to expand into the Asia-Pacific market.

Conclusion 3: *The economic assessment fails to recognise the impact of the project on Coolmore Australia and Darley Australia, their critical contribution to the regional and NSW economies and the economic impact that would result if they were forced to relocate interstate.*

3.1 Coolmore and Darley's regional significance

Coolmore Australia and Darley Australia businesses (located across the road from, and within 1km of, the proposed Drayton South open cut coal mine development) are Australia's largest thoroughbred breeding studs. Coolmore Australia and Darley Australia's combined stallion fee earnings of \$100 million (in the Hunter Valley) was greater than the total stallion standing fees earned by studs located outside of the Hunter Valley (\$64 million) and all other studs in the Hunter Valley (\$85 million), (source Stud Book, 2011).

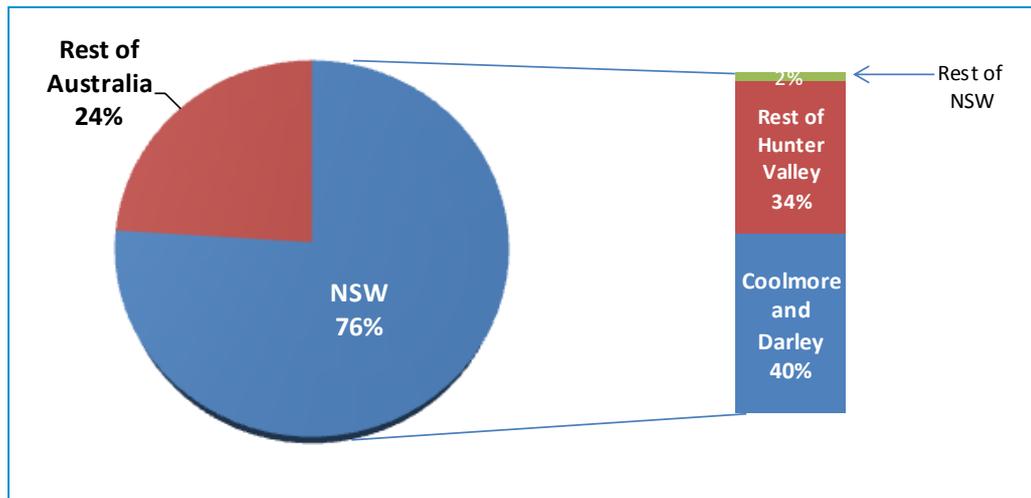
Consequently, Coolmore Australia and Darley Australia are critical players in the Hunter Valley thoroughbred cluster because they are the largest international scale thoroughbred studs in Australia (in both physical scale and market share), see Figure 11. These two studs alone constitute the epicentre of Australia's and NSW's thoroughbred breeding industry and any impacts on their business operations will impact all other related and support services. A fact that is confirmed in NSW Department of Trade and Investment (2014): *"the Coolmore and Woodlands (Darley) thoroughbred stud enterprises are pivotal (core businesses) to the sustainability of the Upper Hunter Equine Critical Industry Cluster and should be protected."*²

As Michael Ford, Keeper of the Australian Stud Book, recently stated:

"The stand-out fact is that Coolmore and Darley produce 40% of the estimated income earned in Australia, while the Hunter Valley produces 74% leaving only 2% for the rest of New South Wales, and 24% for all the other states" (27 March 2013).

² <https://majorprojects.affinitylive.com/public/de66f6885b3e911bc0feec1dc740bdae/Drayton%20South%20-%20NSW%20Trade%20and%20Investment%20-%20Response%20to%20PAC%20Review.pdf>, accessed 8 September 2015

Figure 11: Stallion Fees³ (2011)



Source: Australian Stud Book, 2011

If Coolmore Australia and Darley Australia were to leave the Hunter Valley and move to Victoria it would have a massive impact on the thoroughbred breeding industry and related industries, both within the Hunter Valley and NSW.

3.2 Premium Thoroughbred Stud: Business model

Coolmore Australia and Darley Australia are premium stallion farms. For instance, based on Marsden Jacob's analysis in 2013 their average service fees were over \$40,000, nearly double the average for the Hunter Valley (\$23,413), more than treble the NSW average (\$11,507) and nearly 700% higher than the national average (\$6,110).⁴

This means that their business model is different to both broodmare farms and most other stallion farms.

Image, client perception, visual presentation and reputation are all critical components in a premium thoroughbred stud's business model. This is consistent with international best practice and can be witnessed at leading studs worldwide.

Coolmore Australia and Darley Australia provide services to and compete in a highly competitive environment for investment catering to a broad spectrum of clients, including syndicates of everyday investors, high net worth clients and racing enthusiasts who are highly mobile in their market choices. These clients choose to have their mares serviced by the stallions that stand at Coolmore Australia and Darley Australia because they hope to breed a successful race horse.

To attract and retain their clients, Coolmore Australia and Darley Australia have invested millions of dollars into their bloodstock and properties to ensure they present as world class facilities to both existing and new clients.

Coolmore Australia and Darley Australia believe that the construction of an open-cut mine across the road from their properties will immediately and permanently impact on their business

³ Stallion fees are paid by a mare owner to a stallion owner for the right to breed to it. Stallion standing fees are a key source of income for stallion farms. Other income sources include yearling sales and agistment of pregnant mares.

⁴ Australian Stud Book data from 2011.

model. Furthermore, as soon as the impact occurs it is too late, no amount of monitoring could undo the impact.

This conclusion has been confirmed by the NSW Government Mining and Petroleum Gateway Panel: *“the Panel’s view is that open-cut coal mining as proposed at Drayton South, and thoroughbred horse breeding studs of the nature, scale and importance of Coolmore and Woodlands (Darley), are incompatible land uses that cannot coexist in close proximity”* (December 2013, page 3).

Anglo American and the Department do not understand the business model

It is clear that both Anglo American and the Department do not understand Coolmore Australia and Darley Australia’s business models and they seriously underestimate the regional economic impact that would eventuate if they were to relocate.

The Secretary’s Environmental Assessment Report states: *“ the Department notes that there are likely to be a number of economic and practical barriers to the relocation of these thoroughbred operations (such as the proximity to other thoroughbred operations in the Upper Hunter and Sydney, and the existing capital investment in the studs), and even if the owners of these operations did decide to leave the area, there is no reason why the properties could not continue to be used to breed thoroughbred horses in the future, albeit in all likelihood by operations without the international reputation of Coolmore and Darley.”*

There is a misconception that the capital investment in their properties and proximity to the Hunter Valley are material barriers to relocation. Coolmore Australia and Darley Australia do not wish to leave the Hunter Valley. However, it is important for the Planning Assessment Commission to understand that:

- earnings from stallion fees are fundamental to Coolmore Australia and Darley Australia’s business viability;
- their bloodstock (stallions and mares) is valued in the hundreds of millions and this is far greater than the property values;
- if Coolmore Australia and Darley Australia are forced to relocate they will take their clients and valuable bloodstock with them. They will not leave a void in the market; and
- in our interviews with regional stakeholder, numerous have commented that if Coolmore Australia and Darley Australia were forced to relocate the impact on the equine Critical Industry Cluster will be devastating. Critically all of them commented that stallion farms are the centre of the industry, so if they move the rest of the industry will move.

This means that even if the another equine farm operator were to locate on Coolmore Australia and Darley Australia’s properties (if they were forced to relocate) then the net economic impact on NSW would not be mitigated.

This was confirmed by a number of stakeholders who spoke at the review Planning Assessment Commission hearing, the mares follow the stallions because the cost of transporting a mare (estimated at around \$1,500 per mare from NSW to Victoria based on discussions with transport operators) is considerably less than the service fees which range from tens to over a hundred thousand dollars. In fact, both operations have advised that a number of their clients already transport their mares over considerable distances to be serviced by their stallions.

Earlier analysis by Marsden Jacob (2013) found that the:

- direct economic loss to the NSW economy that results from Coolmore Australia and Darley Australia relocating to Victoria would be between \$229 m (base case) and \$368 m (sensitivity test), in net present value terms;
- Coolmore Australia and Darley Australia directly employ up to 300 people during the breeding season in their Hunter Valley operations;
- if Coolmore Australia and Darley Australia were forced to depart this would very conservatively put 640 jobs at risk in the Hunter Valley across broodmare farms, veterinary hospitals, transport, farriers, saddlers, capital equipment, hospitality, construction that are not supplying the mines; and
- if Coolmore Australia and Darley Australia were forced to depart this would extract over \$120 million per annum in gross regional production from the local economy.

3.3 Hunter Valley thoroughbred breeding industry is important and interconnected

Hunter Valley thoroughbred breeding industry is a vertically integrated and interdependent regional and national industry whose reputation is internationally acclaimed. The regional industry includes stallion farms, broodmare farms and a sophisticated network of support and supply industries that would not be in the region but for the stallion farms. The industry employs nearly 4,797 people⁵ directly and thousands of people indirectly in the Hunter Valley and is a critical contributor to the many thousands of people and participants in NSW and Australia's thoroughbred breeding and racing industry.

The Hunter Valley is Australia's largest producer and exporter of premium quality thoroughbreds. The multi-billion dollar industry is one of three Centres of Thoroughbred Breeding Excellence in the world. It has the largest concentration of studs in the world outside of Kentucky in the USA. It is supported by a sophisticated network of equine support industries that would not be in the Hunter Valley but for the thoroughbred breeding studs, including the Scone Equine Hospital the largest equine hospital in the southern hemisphere.

The interconnected nature of the industry is founded on the strength and reputation of their stallion farms and supported by over 150 broodmare farms and a network of support and supply industries that have established in the Hunter Valley, including feed merchants, saddlers, farriers, horse transportation, vets (and the Scone Equine Hospital) and tourism. All of these organisations are reliant on Coolmore Australia and Darley Australia, because the industry's focal point is the stallion farms, without these the other businesses would not be located in the Hunter Valley.

Critical source of economic diversification

The thoroughbred industry is a critical source of employment and economic diversification in the Hunter Valley. Recent analysis by the Regional Australia Institute highlights the critical importance of economic diversification in regional economies: *“Economic diversification plays an important role in providing resilience and flexibility for regional Australia's economies. Without this cushion, regional economies may suffer disproportionately during adverse external*

⁵ IER (2014) Size and Scope of the NSW Racing Industry, http://www.olgr.nsw.gov.au/pdfs/racing/NSWRacingStudy_lowres.pdf

shocks, with exacerbated negative effects on employment security, income and living standards.” (page 3)⁶

Confirming the importance of the thoroughbred industry as a key source of economic diversity in the Hunter Valley, in 2009 Ernst & Young (2009) found that thoroughbred industry income was \$298 million. This is nearly double the gross value of irrigated agricultural production for the Hunter-Central Rivers region of \$155 million (excluding the thoroughbred industry), based on ABS data. The next biggest sectors are dairy (\$65 million), meat cattle (\$30 million) and hay (\$7 million).

Finally, the minerals sector downturn is already being witnessed in the Hunter Valley with many communities and businesses being adversely impacted. If the critical equine cluster is fragmented by the development of the Drayton South open-cut mine forcing Coolmore Australia and Darley Australia to relocate this will further amplify the vulnerability of the region to economic and climatic shocks.

3.4 Concluding remarks

Coolmore Australia and Darley Australia are critical players in the Hunter Valley thoroughbred cluster because they are the largest international scale thoroughbred studs in Australia (in both physical scale and market share).

Testament to the fact that Coolmore Australia and Darley Australia believe that “*open-cut coal mining and a viable international-scale thoroughbred breeding enterprise are incompatible land-use*”. Experts commissioned by Coolmore Australia and Darley Australia have confirmed that the mine will irreparably damage their business model.

For instance, Coolmore Australia and Darley Australia’s expert advisors have stated that:

- there are serious deficiencies in the air, noise, water, visual and economic impact analysis;
- there are unacceptably high visual risks which will irreversibly alter the Hunter Valley landscape and topography. The visual impact of this proposed mine will be evident for over two decades; and
- that the horse health assertions are incorrect or have little relevance to the majority of horses in the Hunter Valley region.

This report along with other independent expert reports identified the very real impacts and risks associated with the proposed mine and comes to the conclusion that development of the mine would not be economically beneficial to NSW.

⁶ www.regionalaustralia.org.au/wp-content/uploads/2013/07/Diversification-Policy-Paper-RB_V2.pdf, accessed 10 March 2014

4. Conclusion 4: The analysis does not comply with the SEARs and NSW Guidelines

The Gillespie Economics report claims that the analysis has been produced in accordance with the following requirements and guidelines:

- The Secretary’s Environmental Assessment Requirements (SEARs) for the Project that relate to economics (DPE, 2015);
- EP&A Act and Environmental Planning and Assessment Regulation 2000;
- Guideline for the use of cost benefit analysis in mining and coal seam gas proposals (NSW Government 2012);
- NSW Government guidelines for economic appraisal (NSW Treasury 2007); and
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries Amendment (Resource Significance) 2013.

Conclusion 4: *The economic assessment does not comply with the SEARs or the NSW government guidelines.*

4.1 Secretary’s Environmental Assessment Requirements (SEARs)

The SEARs require that Anglo American undertake a “*Social and Economic*” assessment that includes:

- *“a detailed assessment of the likely social impacts of the development on the local and regional community, paying particular attention to impacts on the operation and reputation of the Upper Hunter Equine and Viticulture Critical Industry Clusters and the associated tourism industry; and*
- *a detailed assessment of the likely economic impacts of the development, paying particular attention to:*
 - *the costs and benefits of the project, identifying whether the development as a whole would result in a net benefit to NSW, including consideration of fluctuations in commodity markets and exchange rates; and*
 - *the demand for the provision of local infrastructure and services, having regard to Muswellbrook Shire Council’s requirements”.*

And, the supplement to the SEARs requires that:

“The economic and social impacts of the action, both positive and negative, must be analysed. Matters of interest include:

- a) details of any public consultation activities undertaken, and their outcomes;*
- b) details of any consultation with Indigenous stakeholders.*
- c) projected economic costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies;*

- d) *employment opportunities expected to be generated by the project (including construction and operational phases).*

Economic and social impacts should be considered at the local, regional and national levels. Details of the relevant cost and benefits of alternative options to the proposed action, as identified in Section 4 above, should also be included.

Identification of affected parties is required, including a statement mentioning any communities that may be affected and describing their views.” (Section 7)

Review findings: SEARs

Marsden Jacob’s review finds that the economic assessment does not comply with the SEARs. Compliance is essential to ensure that an unbiased, verifiable and transparent economic assessment is undertaken.

The current assessment does not meet the SEARs where detail, accuracy and transparency are concerned, because:

- it is not a “*detailed assessment*” – much of the key information is only reported at an aggregated level so it is not possible to verify or check either the calculations or assumptions that underpin the calculations for key variables.
- the “*projected economic costs and benefits of the project, including the basis for their estimation*” has not been detailed for a number of key variables.
- the economic analysis does not pay “*particular attention to impacts on the operation and reputation of the Upper Hunter Equine and Viticulture Critical Industry Clusters and the associated tourism industry*”. The analysis simply asserts that the Drayton South open-cut coal mine will have no impact on the viability of the neighbouring studs. Experts engaged by Coolmore Australia and Darley Australia have confirmed that the studs will be adversely impacted by the proposed Drayton South open-cut coal mine. This is clear testament to the fact that this proposed mine will adversely affect their business model and viability. The standing of these impacts has been recognised by the Drayton South Review Planning Assessment Commission, Drayton South Decision Planning Assessment Commission and the NSW Mining and Petroleum Gateway Panel.

4.2 NSW Government Guidelines for Economic Appraisal (TPP07-5)

The authoritative source on economic assessment in NSW is the NSW Government Guidelines for Economic Appraisal (TPP07-5) issued by NSW Treasury. These guidelines state that:

- “*The key to the analysis is a complete and accurate enumeration of all the costs and benefits associated with a project.*” (page 50)
- “*All relevant cost items which can be identified, quantified or estimated must be included*”; and
- “*Assumptions underlying all estimates should be made explicit in the evaluation.*” (page 17)

This detail is necessary to ensure that there is no project bias in the analysis: “*Treasury considers how the data are produced and reviews the assumptions incorporated in the analysis.*”

This is to ensure there is no “project bias” in the analysis, for example, in terms of overoptimistic benefits and/or underestimated costs” (page 4).

Review findings: NSW Treasury guidelines

The economic assessment does not meet NSW Treasury requirements, because

- the calculations are not accurate;
- all relevant cost items have not been quantified;
- assumptions underlying many of the estimates have not been made explicit.

The analysis also does not meet the sensitivity testing requirements as specified in the guidelines. The current sensitivity tests do not consider worst case outcomes, instead the analysis downplays the sensitivity of the present value outcomes.

Where the NSW sensitivity tests are concerned (Table 4.6 in Gillespie Economics 2015) a number of the sensitivity tests make no sense, for instance:

- Groundwater: How can the present value outcome increase by \$87 million under both +/- 20% sensitivity tests?
- Opportunity cost of land: Why doesn't the opportunity cost of land, which is all based in NSW, change the result under +/-20% sensitivity tests?

Furthermore, because the cost-benefit analysis has been undertaken from a national perspective the sensitivity analysis for NSW is predominantly showing how royalty and tax benefits to NSW change under different assumptions. There are two problems with this:

1. royalties are financial transfers between the project proponent and the NSW Government, as confirmed by the fact that the operating costs in the analysis exclude royalties (Gillespie Economics, 2015, E-33). Thus while they represent a financial gain to NSW, the economic analysis of the project really should be focused on the net social benefit/cost of the project.
2. royalty returns are also directly linked to production tonnes and assumed coal prices, so similar to the ‘value of coal’ calculation (discussed earlier) the royalties are also currently over-stated.

Attachment A: Value of Coal

Table 6 details the value of coal present value calculation at AUD\$87 per tonne.

Table 6: Value of Coal at AUD\$87/t

	Marsden Jacob (\$m NPV)	Gillespie 2015 (\$m NPV)	Difference	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
COAL PRODUCTION																				
ROM Coal (Mt)				0	0	3.34	3.00	3.99	4.23	5.57	5.89	5.73	5.79	6.18	5.87	6.06	6.31	5.99	3.64	1.85
Product Coal (Mt)				0	0	2.43	2.14	2.90	3.03	4.04	4.21	4.10	4.15	4.43	4.28	4.47	4.63	4.44	2.73	1.46
Yield (%)				0	0	72.7	71.3	72.8	71.6	72.4	71.5	71.6	71.6	71.6	73.0	73.8	73.4	74.0	74.9	78.6
VALUE OF COAL																				
Assumed Coal Price (\$AUD)				0	0	85	96	87	87	87	87	87	87	87	87	87	87	87	87	87
Value of Coal (\$m)	2,586	2,999	- 413	0	0	206	206	253	263	351	367	357	361	385	373	389	403	386	237	127

Source: Marsden Jacob, 2015

Table 7: Value of Coal at US\$87/t (AUD\$102.35/t)

	Marsden Jacob (\$m NPV)	Gillespie 2015 (\$m NPV)	Difference	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
COAL PRODUCTION																				
ROM Coal (Mt)				0	0	3.34	3.00	3.99	4.23	5.57	5.89	5.73	5.79	6.18	5.87	6.06	6.31	5.99	3.64	1.85
Product Coal (Mt)				0	0	2.43	2.14	2.90	3.03	4.04	4.21	4.10	4.15	4.43	4.28	4.47	4.63	4.44	2.73	1.46
Yield (%)				0	0	72.7	71.3	72.8	71.6	72.4	71.5	71.6	71.6	71.6	73.0	73.8	73.4	74.0	74.9	78.6
VALUE OF COAL																				
Assumed Coal Price (\$AUD)				0	0	85	96	102	102	102	102	102	102	102	102	102	102	102	102	102
Value of Coal (\$m)	2,981	2,999	-18	0	0	206	206	297	310	413	431	420	424	453	438	457	474	454	279	149

Source: Marsden Jacob, 2015

Note: The difference of 0.6% can be readily explained by a rounding error.