SUBMISSION

Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals

November 2015

NSW MINERALS COUNCIL
# Table of Contents

**Executive Summary** ........................................................................................................... 3

**About the NSW Minerals Council** .................................................................................. 5

**Economic Assessment Guidelines: Key Issues** ................................................................. 6

**Economic Assessment Guidelines: Detailed Comments** .................................................. 11

- Direct Benefits .................................................................................................................. 12
- Indirect Benefits ............................................................................................................... 13
- Indirect Costs ................................................................................................................... 15

**Local Effects Analysis** .................................................................................................. 21

**Worksheets** .................................................................................................................. 22

**Annexure A: Testing the Draft Economic Guidelines** ..................................................... 23

- Worked Example 1: Open-cut operation ........................................................................... 23
- Worked Example 2: Underground operation ..................................................................... 26
- Worked Example 3: Open-cut operation (2) .................................................................... 28
Executive Summary

The NSW Minerals Council (NSWMC) welcomes the opportunity to comment on the draft Guidelines for the economic assessment of mining and coal seam gas proposals (“Draft Guidelines”), as part of the NSW Government’s proposed Integrated Mining Policy (“IMP”).

The development of a clear, robust set of economic assessment guidelines is of critical importance to the industry, and NSWMC has consistently called for clearer guidance from government on the methodology and process for the preparation of economic assessments for mining projects.

Recent events have demonstrated the fundamental importance of clear economic assessment guidelines for mining developments. It is imperative that the NSW Government ensures the new guidelines comprehensively address deficiencies in the current guidance provided to proponents, as failure to do so will deter proponents from potential future investment in NSW in favour of other, more attractive jurisdictions.

It is in this context that the Draft Guidelines must be assessed.

NSWMC anticipates that a number of stakeholder submissions will contend that the only benefit of mining developments for NSW is royalty payments. Such claims are often promoted by those who oppose mining-related developments generally. NSWMC rejects this view, and welcomes the recognition in the Draft Guidelines that mining projects can have net economic benefits for NSW landholders, workers and suppliers.

However, NSWMC has identified a number of issues in the Draft Guidelines that will have undesirable implications for proponents and that, when considered as a whole, will unfairly limit the ability of a proponent to demonstrate a project’s benefits, while at the same time inflating the costs. The key issues are:

- **The Draft Guidelines are highly prescriptive in nature.** NSWMC appreciates that this is reflective of the NSW Government’s desire for greater transparency in the mining project approval process, and is an attempt to provide the industry with greater certainty. However, the level of prescription in the Draft Guidelines is problematic in that any attempt to provide a standardised, ‘one-size-fits-all’ recipe for economic assessment is not feasible - prescribed parameters will never be appropriate for each unique, complex mining proposal.

- **Aspects of the Draft Guidelines are unworkable.** The Draft Guidelines and accompanying workbooks make no allowance for different types of commodity (or grade of commodities such as thermal or coking coal). Nor do the Draft Guidelines provide for a sensitivity analysis for the commodity price. Both are key components of any CBA and their omission from the Draft Guidelines means any assessment will be flawed.

- **Some of the underlying data required by the Draft Guidelines is commercially sensitive.** The information required to estimate benefits to existing landholders and NSW suppliers, among other things, is of a commercially sensitive nature. It is highly doubtful that a proponent will be able to obtain such information.

- **The Draft Guidelines are highly conservative.** A highly conservative (and in some instances inconsistent and inequitable) approach has been adopted – for example using the relatively high mining-sector wage as a ‘reservation wage’ - that limits the ability of a proponent to realistically demonstrate a project’s benefits, while at the same time potentially inflating the
costs. This outcome was demonstrated in the case-studies NSWMC undertook in testing the Draft Guidelines, as outlined in Annexure A.

- **The calculation of greenhouse gas emissions is inconsistent with the broader Guidelines.** The prescribed methodology used to calculate emissions is inherently flawed in that it attributes the total cost of these emissions to the NSW population, as opposed to NSW’s share of the global population. This is fundamentally inconsistent with the approach taken elsewhere in the Draft Guidelines, as only benefits attributable to NSW can be calculated and included in the assessment. To ensure consistency, the costs of greenhouse gas emissions associated with a mining development should only comprise that component of cost that is attributable to NSW based on population share.

- **The worksheets as they are currently designed are impractical, difficult to apply, and complicate the process.** Given the inconsistencies and complexity of the workbooks, there is an increased probability or errors being made if they were applied in their current form. The workbooks are of questionable utility and should be removed from the Draft Guidelines.

Without amendment, NSWMC believes that the Draft Guidelines fall short of providing proponents with a robust and workable set of guidelines and worksheets on which to base an assessment of proposed mining developments. The Guidelines will inadvertently serve to limit the ability of a proponent to realistically demonstrate a project’s benefits, while at the same time potentially inflating the costs.

NSWMC recommends the NSW Government reconsider the prescriptive nature of the Draft Guidelines. Instead of prescribing the approach to be taken, the Guidelines should provide proponents with the flexibility to undertake a CBA assessment using the evidence and processes they feel best suit the assessment being undertaken. The Department of Planning and Environment (“the Department”) should then provide guidance on the level of detail required to ensure the appropriate level of transparency, in terms of methodology, data and assumptions to be reported. In this way, the unique circumstances of every mining proposal can be catered for without compromising transparency and certainty.

NSWMC has sought expert economic advice of Cadence Economics, an economics consultancy firm. Their advice, together with feedback and guidance from NSWMC members forms the basis of this submission.
About the NSW Minerals Council

The NSW Minerals Council is the peak industry association representing the State’s $21 billion minerals industry.

NSWMC provides a single, united voice on behalf of our 85 members, ranging from junior exploration companies to international mining companies, as well as associated service providers.

Mining has and will continue to be a key economic driver for NSW. NSWMC works closely with government, industry groups, stakeholders and the community to foster a strong and sustainable minerals industry in NSW.
Economic Assessment Guidelines: Key Issues

NSWMC notes that the Draft Guidelines are significantly more detailed and prescriptive than the existing Guidelines. As a simple metric, the Draft Guidelines are 98 pages in length (excluding the workbooks), whereas the existing Guidelines are 14 pages.

NSWMC appreciates that the level of prescription is consistent with the NSW Government’s objectives of providing greater transparency for the approval of mining projects, whilst at the same time attempting to provide the industry with greater certainty.

However, NSWMC has identified a number of issues in the Draft Guidelines that will have undesirable implications for proponents and that, when considered as a whole, will unfairly limit the ability of a proponent to realistically demonstrate a project’s benefits, while at the same time inflating the costs. Such an outcome is perverse and NSWMC understands that this is not the NSW Government’s intention.

Without amendment, NSWMC believes that the Draft Guidelines fall short of providing proponents with a robust and workable set of guidelines and worksheets on which to base an assessment of proposed mining developments.

The Draft Guidelines are overly prescriptive

The Draft Guidelines are highly prescriptive in nature, in that they effectively detail, to a greater or lesser extent, the exact approach required by the Department in undertaking an economic assessment of a proposed mining development. This over-prescription is a departure from the majority of economic assessment guidelines currently in use in Australia.

NSWMC believes that the level of prescription in the Draft Guidelines is problematic in that, because every proposed mining development is unique, any attempt to provide a standardised, ‘one-size-fits-all’ recipe for economic assessment is unworkable.

A prescriptive approach is more likely to be of value when the Department is considering high volume, relatively small investments that have very localised impacts, such as housing approvals. However, it is not appropriate for large, complex investments such as mining operations that have a multitude of direct and indirect effects that are important in assessing net benefits.

An example of this prescription is the draft Guidelines requirement for applicants to provide a “Central Case” estimate of economic impacts using set parameters. Whilst applicants can provide alternate estimates using different values and assumptions provided that detailed supporting evidence is provided to justify the change, they must first complete the Central Case estimate, despite the fact that the prescribed parameters will never be appropriate for each unique, complex mining proposal.

The ‘Central Case’ requirement places the prescribed methodology and worksheets as the default setting for each proponent. Any alterations are effectively sensitivity analysis from the ‘Central Case’ and must be justified. In other words, the onus is on those with more intimate knowledge of a particular mining project to argue any deviations from the prescribed process, and provide estimates of the difference – notwithstanding the fact that the ‘Central Case’ parameters will never be appropriate to any real world proposal.

NSWMC strongly opposes both the ‘Central Case’ requirement and the level of prescription permeated through the Draft Guidelines. Not only does this approach add to the overall level of complexity and
costs associated with undertaking an analysis, it is also predicated on the Department successfully developing Draft Guidelines that are flexible enough to account for the unique circumstances that mining developments might encounter; as well as developing quite complex methodologies to deal with matters, such as estimating the benefits to NSW workers, which can also be specific to individual developments.

In NSWMCs respectful assessment, this is neither feasible nor appropriate.

NSWMC recommends that the NSW Government reconsiders the prescriptive nature of the Draft Guidelines. Instead of prescribing the approach, parameters and methodology as currently outlined, the Guidelines should provide proponents with the flexibility to undertake a CBA assessment using the evidence and processes they feel best suit the assessment being undertaken. The Department should then provide guidance on the level of detail required to ensure the appropriate level of transparency, in terms of methodology, data and assumptions to be reported. In this way, the unique circumstances of every mining proposal can be catered for without compromising transparency and certainty.

**Recommendation:**

- The NSW Government reconsider the prescriptive nature of the Draft Guidelines.
- The Draft Guidelines should adopt an approach which allows proponents the flexibility to undertake a CBA assessment using the evidence and processes they consider most appropriate.

**Aspects of the Draft Guidelines are unworkable**

NSWMC has identified a number of key structural and technical issues with the Draft Guidelines that, when taken as a whole, render the package largely unworkable. It is imperative that these issues be addressed.

Critically, the Draft Guidelines and accompanying workbooks make no allowance for different types of commodity (or grade of commodities such as thermal or coking coal). Nor do the Draft Guidelines provide for a sensitivity analysis for the commodity price. Instead, a single coal production and revenue figure is required as input into the CBA worksheet. Both are key components of any CBA and their omission from the Draft Guidelines means any assessment will be flawed.

Further, NSWMC notes that when estimating company tax, capital costs are to be treated as an operational expenditure. Contrary to standard practice, the modules don’t allow for the capital costs to be depreciated over the life of the asset, the effect of which is to bring forward the capital costs and reduce the overall benefit of the project.

Furthermore, when calculating royalties the Draft Guidelines do not account for any discounts that are allowable. In practice, coal royalties are generally discounted by $3.50 per tonne to allow for coal washing and this should be accounted for.

The worksheets as they are currently designed are impractical, difficult to apply, and serve to overly complicate the CBA process. In addition, the relationship between the Draft Guidelines and the worksheets is unclear. For example, the CBA section is linked to a single workbook (that has 22
worksheets), yet makes no reference to the associated workbooks in its description of how to implement the Draft Guidelines.

NSWMC’s assessment is that given the inconsistencies and complexity of the workbooks, there is an increased probability or errors being made if they were applied in their current form.

NSWMC believes that the workbooks are of questionable utility and recommends their removal from the Draft Guidelines. The workbooks could be replaced with a series of ‘practitioner notes’ that provide guidance for proponents undertaking an economic assessment. In this regard there is precedent, as both the Australian Taxation Office and Infrastructure Australia make use of practitioner notes to provide advice and guidance in relation to a range of issues.

**Recommendation:**

- The Draft Guidelines should be reviewed in consultation with Industry, and key structural and technical issues should be addressed.
- The worksheets should be removed from the Draft Guidelines, and replaced with a series of ‘practitioner notes’.

**The Draft Guidelines are highly conservative**

While the Draft Guidelines focus on proponents developing a CBA of proposed mining developments, it is important to note that CBA is not the only technique for judging the net benefits of a proposed mining expansion. Another common technique is the economic impact assessment through computable general equilibrium (CGE) modelling. These techniques each have their strengths and weaknesses and both provide useful information to decision-makers.

A CBA is by design conservative. Specifically, it is a tool commonly used by government to consider a wider range of (social) costs and benefits beyond what private proponents consider, which tend to be more of a private nature. It is also a mechanism for promoting greater accountability when government considers the expenditure of public funds. Government requires a broad framework upon which to base its decisions given it does not face the types of market disciplines private-sector proponents do, coupled with the fact that many expenditures don’t generate market returns.

The Draft Guidelines adopt a highly conservative (and in some instances inconsistent and inequitable) approach. This is evident, for example, in:

- the exclusion of State taxes and local government contributions from the direct benefit component of the analysis;
- the relatively high implied ‘reservation wage’ for mining;
- lack of clarity around supplier benefits;
- movement to a simplistic accounting treatment of capital expending to determine company tax benefits;
- consideration of public infrastructure costs, but not benefits;
- consideration of costs to producer surplus in the region attributable to the mining development, but not benefits;
- a greater emphasis on greenhouse gas emissions in the methodology both in terms of extending coverage to Scope 2 emissions as well as the range of costs prescribed; and
- the change in methodology used for PM2.5 shifting to a direct emission measure.
These matters are discussed in greater detail throughout this submission. Ultimately, the conservative nature of the Draft Guidelines limit the ability of a proponent to demonstrate a project’s benefits, while at the same time potentially inflating the costs. This was demonstrated in the case-studies the NSWMC undertook in testing the Draft Guidelines.

While the change in methodology may be justifiable from a theoretic perspective, NSWMC believes such an outcome is perverse and understands that this is not the NSW Government’s intention. As such, NSWMC recommends that the Department addresses the extent of conservatism in the Draft Guidelines, and notes, for the benefit of stakeholders, the conservatism in the proposed CBA methodology.

Recommendation:

- The conservative approach taken in the Draft Guidelines should be formally recognised in the document.

The intent of the Draft Guidelines is unclear

The stated purpose of the Draft Guidelines, as detailed on page 5, is to:

‘…assist proponents with providing the necessary information to meet some of the requirements of section 79C of the Environmental Planning and Assessment Act 1979 (EP&A Act).’

NSWMC supports this aim. However, NSWMC is concerned with the use of the term ‘adequacy’ as stated on page 11:

‘The Guidelines will also be used to assess the adequacy of a proponent’s economic assessment report’ [emphasis added].

It is unclear what is meant by ‘adequacy’, which of itself is a subjective term. The Guidelines should serve primarily to provide guidance to enable a proponent to prepare an economic assessment in accordance with legislative and policy requirements. The term ‘adequacy’ has not been defined and clear guidance is required.

Recommendation:

- The term ‘adequacy’ should be clarified.

Projects must be assessed on their individual merits

The Guidelines should not be used to compare different mining proposals against one another. Further, it is important to recognise that a proponent’s CBA (and subsequent Net Present Value (“NPV”)) may not be reflective of the criteria and decision-making used to assess the viability of a proposed development.
Proponents will have a range of internal metrics and assessments (such as commodity prices, production costs, rates of return, etc.) that may influence their decision to undertake a development. Another key criteria for proponents is consideration of how a particular development sits in relation to their portfolio of mining projects, and how it is placed within the proponent's overall risk management strategy. These metrics are of a commercially sensitive nature.

As such, the Guidelines and NSW Government should be cognisant that private decision-makers, in undertaking (and funding) a development application, have revealed their preference to invest private funds into a particular mining development. In investing these private funds, the majority of the risks relating to mining projects are borne by the proponent - who are best placed to manage these risks - not the State.

In the case where an individual mining operation is one in a portfolio of mines, it is not uncommon for the project economics at any particular point in time to, under the assumptions adopted in a CBA, yield sub-optimal or even negative returns and yet still be of commercial value and confer economic benefits to NSW through royalties and benefits to workers, suppliers and landowners.

**Recommendation:**

- The Guidelines must not be used to compare different mining proposals against one another.
- The Department should recognise that a proponent's CBA and NPV may not be reflective of the criteria and decision-making used to assess a project's viability.

**The handling of commercial-in-confidence information should be clarified**

Some of the underlying data required by the Draft Guidelines to undertake a CBA on a mining project is commercially sensitive, and it is highly unlikely that a proponent will be in a position to provide such information. It is unclear how this can be reconciled, and NSWMC would appreciate further clarification.

Further, given that concern for the protection of commercially sensitive information will be a high priority for proponents, the Draft Guidelines should make clear how any such information will be handled in the event that it is provided.

**Recommendation:**

- The provision and handling of commercially sensitive information should be clarified.
Economic Assessment Guidelines: Detailed Comments

The Draft Guidelines centre on the calculation of a CBA for proposed mine developments and is organised into three major components: Direct Benefits; Indirect Benefits and Indirect Costs. The various elements of these components are summarised in Table 1.

<table>
<thead>
<tr>
<th>Direct Benefits</th>
<th>Indirect Benefits</th>
<th>Indirect Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>The net benefits that accrue to NSW from the direct operations of the proposed mine</td>
<td>The net benefits that are generated for parties that economically interact with the proposed mine</td>
<td>Social costs generated by the proposed mine, borne by the NSW community</td>
</tr>
<tr>
<td>Includes: • Net producer surplus attributable to NSW • Royalties payable • Company tax attributable to NSW</td>
<td>Includes: • Net economic benefits to landowners • Net economics benefits to NSW employees • Net economic benefits to NSW suppliers</td>
<td>Includes: • Net environmental, social and transport-related costs • Net public infrastructure costs • Loss of surplus to other industries</td>
</tr>
</tbody>
</table>

As aforementioned, the Draft Guidelines involve a number of significant changes to the methodology from the existing Guidelines. Perhaps the most significant of these is in the calculation of the Total Economic Benefit (TEB) of the project.

The existing Guidelines define TEB as simply the revenue each project generates less costs. The Draft Guidelines move from this approach to a methodology that aims to establish the TEB accruing to NSW. This has three main impacts:

1. The proponent now only attributes an estimate of net producer surplus attributable to NSW which is affected by its ownership share that can be attributed to NSW residents.

2. The proponent must separately account for royalty payments (that all accrue to NSW residents) and company tax payments (that are assumed to accrue to NSW residents on the basis of the existing population share).

3. The proponent must also calculate Indirect Economic Benefits (IEB) of the project which comprise benefits to existing NSW landholders, workers and suppliers.

The previous Guidelines had the benefit of being very simple for proponents to apply. The methodology proposed in the Draft Guidelines while defensible, and sensible in its consideration of Indirect Benefits, is harder to address.

The following information represents detailed comments and recommendations in relation to aspects of the Draft Guidelines.
Direct Benefits

The need for ‘Approach 2’ is unclear

It is unclear as why the Draft Guidelines has adopted two approaches. The only difference between ‘Approach 1’ and ‘Approach 2’ is that the latter does not require the proponent to measure net producer surplus. NSWMC submits that this can be readily determined using other data prescribed for reporting under this approach.

As such, NSWMC considers having two approaches to be of limited benefit and actually adds to the general level of complexity in the Draft Guidelines. As such, NSWMC recommends that ‘Approach 2’ be removed from the Draft Guidelines.

Recommendation:
- The Draft Guidelines should allow for the benefits associated with the provision of public infrastructure to be included.
- ‘Approach 2’ should be removed.

All State taxes and local government contributions should be accounted for

The Draft Guidelines treats royalties and company income tax as components of net benefits, yet does not include other state taxes (such as payroll tax, stamp duty, and land tax) or local government contributions. NSWMC understands that their exclusion relates to the belief that they may provide negligible or no net additional benefit.

NSWMC rejects this argument and notes that their exclusion is inconsistent with the CBA methodology; given that proponents are required to assess negligible costs (such as traffic impacts).

In 2013/14 the NSW mining industry contributed $1,141 million in State taxes and a further $37 million in rates. Although the majority of this contribution was made up of royalties ($945 million), a further $233 million was paid to the NSW Government and local governments. NSWMC does not consider this contribution to be insignificant and as such should be included in the Draft Guidelines for assessment.

Recommendation:
- The Draft Guidelines should account for all State taxes and local government contributions in the calculation of Direct Benefits for the CBA.

Treatment of capital expenditure

The Draft Guidelines treat capital expenditure the same way as operational expenditure when estimating the company tax. This is not appropriate because in practice capital expenditure should be amortised over the asset life period to estimate company taxes.

Recommendation:
- A simple accounting treatment of capital expenditure should be used as the basis of company tax receipts.
Calculation of ownership share is complicated

The Draft Guidelines require a proponent to estimate the Australian share of the project’s ownership, and then apply the default proportion of 32 per cent to estimate the NSW share of ownership. NSWMC submits that in practice ownership share may be very difficult to measure, especially in the case of joint-venture operations.

The Draft Guidelines should allow for greater flexibility and where necessary, a sensitivity analysis on the ownership share should be conducted in the calculation of Direct Benefits for the CBA.

Recommendation:

- Allow for greater flexibility in calculating ownership share.
- Allow for a sensitivity analysis on the ownership share to be conducted.

Discount rates for estimating royalty payments

As aforementioned, the Draft Guidelines do not account for any discounts that are allowable when measuring royalties. In practice, coal royalties are generally discounted by $3.50 per tonne to allow for coal washing and this should be accounted for.

Recommendation:

- Amend the Draft Guidelines to permit allowable deductions when estimating royalty payments.

Indirect Benefits

NSWMC welcomes the recognition in the Draft Guidelines that mining projects have net economic benefits for NSW landholders, employees and suppliers, with the latter two costs representing a significant proportion of any mining project.

However, NSWMC is concerned that the Draft Guidelines employs methodology that will make it more difficult to prove the indirect benefits of a development.

At the outset it should be recognised that calculating Indirect Benefits is a difficult task, and as a result analysis may heavily rely on assumptions and will be open to criticism.

The proposed methodology in the Draft Guidelines has contributed to further complexity as proponents will be required to measure the indirect benefits against a counterfactual that is either not observable or difficult to ascertain.

Adding to this complexity is the commercially sensitive nature of some of the information required on which to base the calculations. As a result, there is the potential that the indirect benefits of a development will be significantly ‘downplayed’ or reduced.
Further, the Draft Guidelines do not provide sufficient information on how applicants should measure the indirect benefits. The main guidance is in relation to employee benefits, which is itself extremely complicated. For example, the Draft Guidelines consider the ‘disutility’ of working in mines without any reference to the extent any such ‘disutility’ exists.

**The use of a mining-sector reserve wage is inappropriate**

NSWMC notes that the Draft Guidelines requires proponents to use the average mining-sector wage instead of the average Australian weekly wage as a reserve wage when calculating net benefits. NSWMC does not support this proposal.

The use of a mining-sector reserve wage is overly conservative since mining wages are higher than the average, and may result in the net benefits to employees being negligible or negative. It also fails to accord with reality, since in most cases employees at a new mine are drawn from a mix of locations and backgrounds, and not just other mining operations.

For example, Whitehaven’s Maules Creek project provided employment for up 600 full-time equivalents and contractors during the construction phase, and 450 full-time employees once fully operational. These employees come from a variety of professional backgrounds, and the majority have been hired from the local Gunnedah/Narrabri region; the unemployment rate of which is higher than the national average.

Importantly, Whitehaven has committed that the Maules Creek workforce will consist of at least 10 per cent from the indigenous and aboriginal community, and has already exceeded that stated aim. Many of these workers were previously unemployed.

It is not appropriate to apply a mining-sector reserve wage for the Maules Creek project and doing so would significantly diminish the operation’s benefits. The same rule applies to other operations.

NSWMC recommends that the use of a mining-sector reserve wage be reconsidered. Instead, and as recommended previously, the Draft Guidelines should provide proponents with the flexibility to undertake their assessments of employee benefits in a manner that reflects the actual situation for the particular project.

Further, the Draft Guidelines state that the CBA should only include the economic benefit to workers already residing in NSW prior to the project. NSWMC believes there is no justification as to why workers who migrate to NSW should not be included in the CBA for NSW, as by migrating to the State and obtaining employment they are effectively part of the NSW community. This differs from employees living outside the State (i.e. FIFO).

**Recommendation:**

- The use of a mining-sector reserve wage is inappropriate and should be reconsidered.
- Employees who migrate to NSW should be included in the CBA.

**Difficulty in estimating benefits to suppliers and landholders**

NSWMC submits that the data required to estimate benefits to existing landholders and NSW suppliers is of a commercially sensitive nature. As a result, it is highly doubtful that a proponent will be able to obtain such information.
Specifically, the Draft Guidelines require proponents to calculate the ‘opportunity cost’ of land when assessing benefits to landholders, with ‘opportunity cost’ based on the value of existing land use.

Where proponents lease land, the economic benefit to landholders is the surplus between the value paid by the proponent less the present value of output, housing, and lifestyle forgone on the lease area of land.

With regard to suppliers, the Draft Guidelines state that the economic benefit gained is through higher surpluses through supplying the mining project; net of any producer surplus loss due to a reduction in an existing industry.

NSWMC submits that, even if this information was not considered commercially sensitive and therefore readily attainable, the level of detail required for compliance is extraordinary and is beyond the capacity of proponents.

Further, NSWMC notes that mining operations, like most businesses, pay market-rates for the provision of goods and services from suppliers. NSWMC is unaware of any operator that seeks to pay above-market rates to suppliers, therefore it is unlikely that ‘higher surpluses’ will be achieved. The same rule applies, to a lesser extent, to the purchase of land.

As with the issues associated demonstrating benefits to employees, the requirement for proponents to supply information that is either commercially sensitive or difficult to obtain will serve to significantly diminish the operation’s projected benefits. NSWMC recommends that further analysis be undertaken in consultation with industry to canvass more thoroughly the issues around the calculation of Indirect Benefits.

Recommendation:

- Calculating benefits to landowners and suppliers will be extremely difficult and should be reconsidered.

Indirect Costs

The Indirect Costs as specified in the Draft Guidelines are comprised of the net environmental, social, transport and social infrastructure costs and indirect costs to other industries. These costs include:

- Aboriginal cultural heritage
- Air quality
- Ambient noise impact
- Biodiversity impact
- Greenhouse gas emissions
- Ground water
- Non-Aboriginal heritage
- Surface water impact
- Traffic impacts
- Visual amenity

NSWMC notes that the majority of the areas are standard in terms of their consideration in the context of environmental impact assessments (EIS)
Mines to should not be linked to Significant Urban Areas

Particulate matter is a widespread air pollutant with a mixture of physical and chemical characteristics that vary by location and source.

The Draft Guidelines sets out both a Damage Cost Approach (“DCA”) and an Impact Pathway Approach (“IPA”) to measure the impact of PM2.5 emissions. The DCA is the methodology set out in the modules and proponents can provide the IPA as an alternative where dispersion modelling has been undertaken. It is highly likely that both these approaches will overstate the impact of PM2.5 emissions.

In particular, the DCA as set out in the Draft Guidelines measures the impact per tonne of emissions to the Significant Urban Area (“SUA”) where the mine operates. The DCA methodology relies on an analysis undertaken by PAEHolmes for the NSW Environmental Protection Agency in 20131. NSWMC notes that the damage cost calculation procedure adopted by PAEHolmes was originally applied to London and extrapolated down to small NSW towns and isolated rural populations.

NSWMC submits that the methodology employed by PAEHolmes has little application to mining projects in NSW, and the use of SUAs as the geographic definition of areas creates significant difficulties in applying the analysis to emissions of mines in NSW.

The use of SUAs is highly convenient when considering issues such as emissions from traffic, households or manufacturing as this activity is often contained within a SUA. However, many mines in NSW are located outside SUAs.

Further, NSWMC notes that PM2.5 emissions from mining operations significantly disperse before they reach populated areas; and, vice-versa, air quality impacts diminish significantly before the boundary of an SUA.

Conversely, the DCA prescribed in the Draft Guidelines measures the particulate matter at the point of generation. This will have the effect of overestimating the externality generated as it does not capture how particulate matter disperses after generation or how they impact surrounding population.

Assigning mines to SUAs has the potential to significantly increase the estimated net costs, with serious implications for the CBA. As such, NSWMC welcomes the ability for proponents to nominate ‘not in any SUA’ for the purposes of their application.

Recommendation:

- SUAs have little application to mining projects in NSW.
- PM2.5 should not be assessed at the point of generation.

The correlation between mining and PM2.5 emissions is weak

NSWMC anticipates that a number of submissions will attempt to argue that mining operations are a significant contributor to PM2.5 emissions, therefore warranting the prescriptive approach taken in the Draft Guidelines. NSWMC rejects these claims.

---

NSWMC recently commissioned Todoroski Air Sciences (TAS) to undertake a review of the state of air quality in the Hunter, with the aim of obtaining an objective assessment of the relative air quality compared to other regions and the likely contributors to particulate pollution. Environmental health consultancy EnRisks has also provided input into the report.

Noting that the final report is yet to be released, NSWMC advises that preliminary results show a weak correlation between mining operations and PM2.5, with much stronger correlations to community centres. The review by EnRisks concludes that the health impacts of PM2.5 from mining operations would be so small as to not be measurable.

Further, NSWMC advises that studies on the particulate matter characterisation in the Upper Hunter Valley conducted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in 2012 indicate that particulate matter from mining operations is just one of many sources of particulate matter and by no means the dominant source. In fact, as identified by CSIRO, that the major contributor of PM2.5 in Muswellbrook is wood smoke arising from domestic wood heaters in contrast to Singleton where it is secondary sulphate.

As such, NSWMC recommends that the Department undertake a thorough review of the air quality-related methodology as it relates to particulate matter in the CBA, in consultation with industry.

Recommendation:

- A review of air quality-related methodology be undertaken in consultation with industry.

Scope 2 emissions should not be included

NSWMC notes that the Draft Guidelines have increased the emphasis on greenhouse gas emissions in the CBA by including Scope 2 emissions.

NSWMC does not support the inclusion of Scope 2 emissions and strongly recommends that it be removed from the Draft Guidelines.

The inclusion of Scope 2 (indirect) GHG emissions from consumption of purchased electricity, heat or steam adds unnecessary complexity to the CBA for little value. As evidenced by the Australian Bureau of Statistics ("ABS"), electricity is a relatively small component of mining costs; counting for less than 1% based on figures from the Australian Bureau of Statistics.³

Further, NSWMC believes that the economic measurement of policy-relevant costs should also consider associated benefits. In this regard, the Draft Guidelines includes calculation of the costs of Scope 2 emissions but fails to include the benefits and value-add associated with them (i.e. the benefits of electricity generation).

Recommendation:

- Calculation of scope 2 emissions should be removed from the Draft Guidelines.

---


3 Australian Bureau of Statistics, Australian National Accounts: Input-Output Tables (cat. no. 5209.0.55.001), 2012-13, Canberra
Calculation of greenhouse gas emissions is inconsistent with the CBA

The prescribed methodology used to calculate emissions is inherently flawed in that it attributes the total cost of these emissions to the NSW population, as opposed to NSW’s share of the global population.

This is fundamentally inconsistent with the approach taken elsewhere in the Draft Guidelines. The defined carbon price paths are, arguably, estimates of the global costs of greenhouse gas emissions. To ensure consistency, the costs of greenhouse gas emissions associated with a mining development should only comprise that component of cost that is attributable to NSW.

Indeed, when calculating benefits, the Draft Guidelines require proponents to only consider net producer surplus and company taxes attributable to NSW, using NSW population shares. As such, the greenhouse gas cost estimate should also be assigned to NSW based on the global population share.

Recommendation:

- The costs of greenhouse gas emissions should only comprise that component of cost that is attributable to NSW.

Calculation of greenhouse gas emissions will lead to perverse outcomes

The Draft Guidelines also increase the emphasis on greenhouse gas emissions by prescribing the consideration of three alternative carbon price assumptions. By doing so, when combined with the stipulated sensitivity analysis, each CBA would need to consider nine different potential estimates of the cost of greenhouse gas emissions. Doing so will lead to an extraordinarily wide range of estimated emissions.

For example, in the open-cut worked example of greenhouse gas emissions, the upper bound estimate of $218 million is around 288% higher than the lower bound estimate of $56 million. Similar to the ‘Central Case’ requirement, this is counterproductive as stakeholders opposed to the development will invariably ‘cherry-pick’ the highest possible estimate and use this to criticise the proposal. Such an outcome is perverse and should be avoided.

NSWMC notes that of the three carbon price assumptions, two are based on estimates of carbon prices that are policy related outcome; only the US EPA price path is an estimate of the net costs of greenhouse gas emissions and therefore is most relevant to the CBA.

A significant issue in relation to the use of the US EPA carbon price path is its sensitivity to the discount rate. The estimated price path quoted in the Draft Guidelines is based on a 5% discount rate. The analysis undertaken by the US EPA clearly demonstrates the impact changing discount rates has on the estimates carbon price path – effectively, the higher the discount rate the lower the estimate.

It would be reasonable to assume that at 7% discount rate, the carbon price path would be very low, yet this has not been considered in the Draft Guidelines.

As such, NSWMC recommends that the Draft Guidelines, as they relate to the calculation of greenhouse gas emissions, requires significant amendment, in consultation with industry.
Recommendation:
- A 7% discount rate should apply to carbon price assumptions.
- A review of greenhouse gas-related methodology be undertaken in consultation with industry.

Loss of surplus to other industries

The Draft Guidelines note that a mining development may impact on the surplus obtained by other industries, such as the tourism or equine industries, and that these impacts should be measured.

NSWMC recommends that this requirement is unworkable and should be removed from the Draft Guidelines. It will be extremely difficult for a proponent to estimate as this information is commercially sensitive, and any such impacts are speculative and may be unobservable.

Further, NSWMC notes that it is extremely unlikely that stakeholders from these industries will be amenable to providing such information, and may have reasons for exaggerating the estimated impact.

There are multiple examples of mines in NSW that have successfully operated close to or under sensitive areas including vineyards, drinking water catchments, thoroughbred breeding operations, agricultural land, lakes and urban areas and it should not be assumed that mining cannot coexist with other land uses.

Further, it should also be noted that in considering the potential loss of surplus to other industries, the Draft Guidelines do not account for any positive impacts of the mine development and operation.

Recommendation:
- The requirement to calculate loss of surplus to other industries should be removed from the Draft Guidelines.

Net public infrastructure costs

The Draft Guidelines require proponents to estimate the net public infrastructure cost of a project; that is, the costs borne by government in building public infrastructure such as roads and drainage.

NSWMC considers the requirement, while reasonable, to be overly conservative. Economic measurement of policy-relevant costs should also consider associated benefits. There are many potential benefits that may arise from the enhanced efficiency of public infrastructure use, yet the Draft Guidelines do not take this into account; nor do they account for any of the potential secondary benefits of public infrastructure investment from proponents (e.g. through the upgrade of aging community infrastructure).

Recommendation:
- The Draft Guidelines should allow for the benefits associated with the provision of public infrastructure to be included.
The use of sensitivity analyses is unclear

Sensitivity analyses are an important element of any economic analysis. As the Draft Guidelines state they provide decision-makers a range of estimates that could arise from the project. Moreover they provide readers of the analysis with the necessary information to both test the assumptions used in the modelling and assess the impact on the results.

The Draft Guidelines do not sufficiently outline how sensitivity analyses are to be undertaken and what information to report and the guidance as it is currently set out is open to interpretation. Importantly, as aforementioned the Draft Guidelines also fail in providing for sensitivities that drive a large proportion of CBA, such as for commodity prices and operational costs.

Recommendation:
- The Draft Guidelines should clearly outline how sensitivity analyses are to be undertaken, and for what purposes.

Other environmental costs

Robust estimates of the costs and benefits of mining are essential for informing the development of proper evidence-based policies.

However, NSWMC is aware that with regard to estimating environmental costs (such as biodiversity impacts), stakeholders opposed to mining developments have previously utilised research studies that contain questionable methodologies, poor-quality data, and inherently biased assumptions that grossly over-estimate the environmental impact of a proposal; so as to justify the adoption of extreme policy measures.

Such studies often have little basis in fact, employ non-mainstream economic theory, and are not peer-reviewed, making it difficult for decision-makers to discern what evidence should be considered bona-fide.

NSWMC recommends that such studies are not fit to be considered as a basis for policy formulation, and encourages the Department to undertake a robust assessment of the methodology used to measure environmental costs, including biodiversity costs, prior to finalising the Draft Guidelines.

Recommendation:
- Further analysis must be undertaken on the methodology used to measure indirect environmental costs.
Local Effects Analysis

The Draft Guidelines set out that the economic analysis is to include a Local Effects Analysis (LEA) to be complementary to the CBA. The LEA is designed to capture the effects to local employment and wages, the local supplier benefits and the environmental and social impacts on the local community.

The LEA is seen as a welcome addition and an important piece of analysis by proponents that will assist them in their community engagement process.

Broadly the LEA methodology as set out in the Draft Guidelines is a new addition to the analysis of mining developments in NSW and unlike the CBA the LEA is not supported with any modules. As a result the initial application of the methodology may be problematic for proponents.

NSWMC recommends that the detailed practice notes should be provided on how to apply the LEA methodology.

Recommendation:

- Detailed practice notes should be provided on how to apply the LEA methodology.

Further, there are potential issues with the Input-Output (IO) methodology as set out in the Draft Guidelines. The IO methodology came under legal review in the Warkworth decision and the continued use may draw criticism from detractors of mining investment. Moreover the Draft Guidelines state the likely range of local effects. It is more correct to suggest IO multipliers (and in particular Type II multipliers) are an upper bound of the potential local effects.

NSWMC recommends that the use of Type II IO multipliers be reviewed to measure the employment effects; consider other methodologies; and set out how proponents could outline an actual range or employment estimates, including the direct and flow-on employment.

Recommendation:

- Type II IO multipliers be reviewed.

In addition the Draft Guidelines provides detail of the WISeR Economic Impact Analysis Tool, and sets out their use within the discussion. The IO tables available on the website that accompany the WISeR Economic Impact Analysis Tool have not been thoroughly assessed in terms of their quality for use in LEA. As such, their recommended use in the Draft Guidelines should be reconsidered.

Recommendation:

- Remove the WISeR tool from the Draft Guidelines and discuss their availability in any practice notes.
- Allow proponents to apply discretion on which IO tool to use.
Worksheets

As aforementioned, the worksheets as they are currently designed are impractical, difficult to apply, and serve to overly complicate the CBA process. NSWMC’s assessment is that given the inconsistencies and complexity of the worksheets, there is an increased probability or errors being made if they were applied in their current form.

As outlined previously, the methodology set out in the modules does not allow any flexibility for the economic assessment, and the various worksheets make no allowance for different types of commodity (or grade of commodities such as low-ash thermal, high-ash thermal, soft (or semi-soft) coking coal, hard coking coal); nor do they provide for a sensitivity analysis for the commodity price.

Further, the particulate matter worksheets sets out that proponents should enter the PM2.5 for the first year of operation and the last and straight-lines the PM2.5 emissions between these two years. This approach is highly flawed as it does not take into account the actual year-on-year PM2.5 emitted. Depending on the actual profile of emissions this may overstate or understate the actual level of emissions and expose the analysis to criticism.

NSWMC has identified a number of other issues with the worksheets, as outlined elsewhere in this submission.

NSWMC submits that the worksheets are of questionable utility and should be removed from the Draft Guidelines; to be replaced with a that provide guidance for ‘information only’, to be used by proponents at their discretion.

Recommendation:

- Remove the worksheets from the Draft Guidelines and replace them with a series of ‘practitioner notes’.
- The industry should be consulted on the development of any such practitioner notes.
Annexure A: Testing the Draft Economic Guidelines

Despite the highly prescriptive and complex nature of the Draft EAG, a Regulatory Impact Statement has not been prepared. Nor have the Draft Guidelines been tested against an existing application that has already gone through the current CBA process to identify flaws and to see if any demonstrable differences in outcomes are produced.

As such, in order to test the materiality of the changes NSWMC has applied the proposed methodology, to the extent possible, to two existing open-cut operations and an existing underground operation.

Worked Example 1: Open-cut operation

The following scenario is based on an existing open-cut operation.

In replicating this analysis, key project assumptions such as, production, coal prices, capital expenditures and operating costs were held consistent with the application made by the proponent in its application. We have applied these parameters to the existing Guidelines and to the proposed Draft Guidelines (summarised in Table 2).

NSWMC has adopted two ownership share assumptions: 10% and 100%. The proponent of the Scenario is predominantly foreign owned, so the 10% assumption reflects the conditions under which that company would apply the proposed Draft Guidelines. The 100% domestic ownership assumption (which implies a 32% NSW ownership share based on the prescribed population shares) is used as a sensitivity analysis.

In its review report the Planning and Assessment Commission noted the Department of Planning’s finding that the CBA for the tested open-cut operation was robust and that the economic benefits for the region and State are significant.

Total Economic Benefits

The analysis shows that TEBs are estimated to fall from $963 million under the Existing Guidelines to $510 million under the methodology prescribed in the Draft Guidelines. This represents just under a 47% reduction in TEBs.

NSWMC was unable to estimate a figure for Indirect Benefits for two reasons:

- in relation to the benefits to NSW workers, the Draft Guidelines opt for a highly conservative assumption around the specification of the ‘reservation wage’.
- the data required to estimate benefits to existing landholders and NSW suppliers is of commercially sensitive nature and so, as a result, was unable to be sourced for these calculations.

Even under an assumption of 100% domestic ownership, the Draft Guidelines are estimated to reduce the overall TEB to $602 million, a 38% reduction.

The conclusion to this analysis is that unless a proponent can establish indirect benefits, which is hampered by the current proposed methodology and data requirements, the Draft Guidelines will make it significantly more difficult to establish net benefits.
Table 2: Total Economic Benefit Calculation for the open-cut operation

<table>
<thead>
<tr>
<th>Category of TEB</th>
<th>Draft Guidelines (10% domestic ownership)</th>
<th>Draft Guidelines (100% domestic ownership)</th>
<th>Existing Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Benefit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Producer Surplus</td>
<td>10.3</td>
<td>102.8</td>
<td>962.9</td>
</tr>
<tr>
<td>Royalties Paid</td>
<td>432.8</td>
<td>432.8</td>
<td></td>
</tr>
<tr>
<td>Company Tax</td>
<td>66.6</td>
<td>66.6</td>
<td></td>
</tr>
<tr>
<td>Total Direct Benefits</td>
<td>509.7</td>
<td>602.2</td>
<td>962.9</td>
</tr>
<tr>
<td>Indirect Benefit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net economic benefit to existing landholders</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Net economic benefit to NSW workers</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Net economic benefit to NSW suppliers</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total Indirect Benefits</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total Economic Benefit</td>
<td>509.7</td>
<td>602.2</td>
<td>962.9</td>
</tr>
</tbody>
</table>

**Indirect Costs**

The prescribed indirect cost estimates involve significant change from previous practice. The two main changes are for air quality and greenhouse gas emissions. It was not possible to calculate the loss of surplus in other industries due to the inherent difficulty of accurately estimating these figures.

To determine the indirect economic costs there are, effectively, two approaches to air quality and three to greenhouse gas emissions, as outlined previously. In order to summarise the effects of different assumptions, NSWMC has determined three indirect cost estimates: a lower bound, a mid-range and an upper bound.

For air quality, the lower bound and mid-range estimates are identical. For greenhouse gas emissions, the results reflect all three carbon price paths identified by the Draft Guidelines. Using mid-range assumptions, the estimated indirect costs have risen from $74 million to $168 million compared with the Existing Guidelines. This represents a 127% increase.

As highlighted in Table 3, this estimate is based on recalculating air quality and greenhouse gas emission externalities only; all other externalities are assumed the same as in the original assessment.

The estimated cost of these two externalities has risen in total from $49.8 million to $143.9 million, which represents a 188% increase.

Another concerning factor is that the range of estimates for air quality and greenhouse gas emissions varies considerably. For example, the upper bound cost for air quality of $121 million is just over 200% higher than the lower bound estimate of $40 million.
The Lower bound estimate includes the “straight-line” approach to measuring PM2.5, where the Mid-range and Upper bound include the cost of actual year-on-year emissions. This is because the reduction in PM2.5 in later years, so the straight-line approach does not capture relatively high emissions in the intervening years.

For greenhouse gas emissions, the upper bound estimate of $218 million is around 288% higher than the lower bound estimate of $56 million.

Table 3: Indirect Costs and Net Economic Benefits for the open-cut operation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPV ($ million)</td>
<td>NPV ($ million)</td>
<td>NPV ($ million)</td>
<td>NPV ($ million)</td>
</tr>
<tr>
<td>Total Economic Benefits</td>
<td>509.7</td>
<td>509.7</td>
<td>509.7</td>
<td>962.9</td>
</tr>
<tr>
<td>Indirect Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air quality</td>
<td>39.4</td>
<td>39.4</td>
<td>120.9</td>
<td>0.1</td>
</tr>
<tr>
<td>Greenhouse gas emissions</td>
<td>56.1</td>
<td>104.5</td>
<td>217.9</td>
<td>49.7</td>
</tr>
<tr>
<td>Visual amenity</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Transport impact</td>
<td>19.1</td>
<td>19.1</td>
<td>19.1</td>
<td>19.1</td>
</tr>
<tr>
<td>Net public infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Surface water impact</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Biodiversity impacts</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Noise impact</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Lost surplus in other industries</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Indirect Costs</td>
<td>119.7</td>
<td>168.2</td>
<td>363.1</td>
<td>74.1</td>
</tr>
<tr>
<td>Net Economic Benefit</td>
<td>146.6</td>
<td>341.5</td>
<td>390.0</td>
<td>888.8</td>
</tr>
</tbody>
</table>

Net Impacts

As a result of lower benefits and higher costs, under mid-range indirect cost assumptions, net benefits are estimated to fall from $889 million to $342 million, which represents a 62% reduction.

If the indirect cost estimates are taken at the upper bound of what is being proposed, they could increase to $363 million.

If this upper bound estimate is adopted, net benefits would be reduced to $147 million, which represents an 83% reduction from the net benefits estimated under the existing Guidelines.
Worked Example 2: Underground operation

The following scenario is based on an existing underground operation.

In replicating this analysis, key project assumptions such as production, coal prices, capital expenditures and operating costs were held consistent with the application made by the proponent in its application. We have applied these parameters to the proposed Draft Guidelines. Due to limitations NSWMC was unable to comprehensively apply the parameters to the existing Guidelines.

As the proponent of the operation is foreign owned, NSWMC has adopted a 0% ownership share assumption.

Under the existing Guidelines, the operation’s Total Economic Benefit is estimated at $902 million and Total Economic Costs at $78 million, equating to a Net Benefit of $824 million and a Benefit-Cost Ratio of 11.56.

As demonstrated in Table 4, under the Draft Guidelines:

- Estimated Total Economic benefit is reduced to $271 million (approx. 70% reduction);
- Estimated Total Economic Costs is reduced $31 million (approx. 68% reduction);
- Estimated Net Benefit is reduced to $240 million; (approx. 71% reduction); and
- Estimated Benefit-Cost Ratio is reduced to 8.77 (approx. 24% reduction).

In relation to Total Economic Costs, NSWMC considers the $31 million figure to be highly conservative, as due to time limitations not all externalities have been comprehensively assessed. It is likely that the actual costs are greater. In addition it is worth noting that some externalities like Aboriginal and European heritage are addressed qualitatively in the Draft Guidelines.

As the case with the open-cut scenario, NSWMC was unable to estimate a figure for Indirect Benefits for two reasons:

- the Draft Guidelines opt for a highly conservative assumption around the specification of the ‘reservation wage’; and
- the data required to estimate benefits to existing landholders and NSW suppliers is of commercially sensitive nature and so, as a result, was unable to be obtained.
<table>
<thead>
<tr>
<th>BENEFITS</th>
<th>COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct benefits</strong></td>
<td></td>
</tr>
<tr>
<td>Net producer surplus attributed to NSW</td>
<td></td>
</tr>
<tr>
<td>Royalties payable</td>
<td>$187,638,012</td>
</tr>
<tr>
<td>Company income tax apportioned to NSW</td>
<td>$83,710,579</td>
</tr>
<tr>
<td><strong>Total direct benefits</strong></td>
<td>$271,348,592</td>
</tr>
<tr>
<td><strong>Direct costs</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Indirect benefits</strong></td>
<td></td>
</tr>
<tr>
<td>Net economic benefit to existing landholders</td>
<td></td>
</tr>
<tr>
<td>Air quality</td>
<td>$749,914</td>
</tr>
<tr>
<td>Net economic benefit to NSW workers</td>
<td></td>
</tr>
<tr>
<td>Greenhouse gas emissions</td>
<td>$17,307,444</td>
</tr>
<tr>
<td>Net economic benefit to NSW suppliers</td>
<td></td>
</tr>
<tr>
<td>Visual amenity</td>
<td>$21,648</td>
</tr>
<tr>
<td>Transport impact</td>
<td></td>
</tr>
<tr>
<td>Net public infrastructure cost</td>
<td></td>
</tr>
<tr>
<td>Surface water impact</td>
<td>$11,477,237</td>
</tr>
<tr>
<td>Biodiversity impact</td>
<td>$353,146</td>
</tr>
<tr>
<td>Noise impact</td>
<td></td>
</tr>
<tr>
<td>Loss of surplus to other industries</td>
<td></td>
</tr>
<tr>
<td><strong>Total indirect benefits</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total indirect costs</strong></td>
<td>$30,924,682</td>
</tr>
<tr>
<td><strong>Total economic benefit of project</strong></td>
<td>$271,348,592</td>
</tr>
<tr>
<td><strong>Total economic cost of project</strong></td>
<td>$30,924,682</td>
</tr>
<tr>
<td><strong>NPV of project - NSW Community</strong></td>
<td>$240,423,909</td>
</tr>
<tr>
<td><strong>BCR</strong></td>
<td>8.77</td>
</tr>
</tbody>
</table>
Worked Example 3: Open-cut operation (2)

The following scenario is based on an existing open cut operation.

In replicating this analysis, key project assumptions such as production, coal prices, capital expenditures and operating costs were held consistent with the application made by the proponent in its application. We have applied these parameters to the proposed Draft Guidelines. Due to limitations NSWMC was unable to comprehensively apply the parameters to the existing Guidelines.

As the proponent of the operation is partly foreign owned, NSWMC has adopted a 50% ownership share assumption.

Under the existing Guidelines, the operation’s Total Economic Benefit is estimated at $2,475 million and Total Economic Costs at $217 million, equating to a Net Benefit of $2,258 million and a Benefit-Cost Ratio of 11.41.

As demonstrated in Table 5, under the Draft Guidelines:

- Estimated Total Economic benefit is reduced to $1,104 million (approx. 55% reduction);
- Estimated Total Economic Costs is reduced $156 million (approx. 28% reduction);
- Estimated Net Benefit is reduced to $947 million; (approx. 58% reduction); and
- Estimated Benefit-Cost Ratio is reduced to 7.1 (approx. 38% reduction).

The main contributor to the reduction in Total Economic Cost is a change in the price path used to measure the indirect cost of greenhouse gas emissions. The greenhouse gas emissions in the Table 5 were estimated using the US EPA Social Cost of Carbon as set out in the modules that included a starting price of $15 a tonne increasing to $27 by 2037.

This differs from the proponent’s EIS, which was undertaken using a starting value of $23 a tonne, increasing by 2.5% for the following three years, to approximately $25 a tonne and remaining constant over the remaining modelling period..

As the case with the other scenarios provided, NSWMC was unable to estimate a figure for Indirect Benefits for two reasons:

- the Draft Guidelines opt for a highly conservative assumption around the specification of the ‘reservation wage’; and
- the data required to estimate benefits to existing landholders and NSW suppliers is of commercially sensitive nature and so, as a result, was unable to be obtained.
Table 5: CBA for open-cut operation (2) ($M)

<table>
<thead>
<tr>
<th>BENEFITS</th>
<th>COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct benefits</td>
<td>Direct costs</td>
</tr>
<tr>
<td>Net producer surplus attributed to NSW</td>
<td></td>
</tr>
<tr>
<td>Royalties payable</td>
<td></td>
</tr>
<tr>
<td>Company income tax apportioned to NSW</td>
<td></td>
</tr>
<tr>
<td><strong>Total direct benefits</strong></td>
<td><strong>Total direct costs</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect benefits</td>
<td>Indirect costs</td>
</tr>
<tr>
<td>Net economic benefit to existing landholders</td>
<td>Air quality</td>
</tr>
<tr>
<td></td>
<td>28.5</td>
</tr>
<tr>
<td>Net economic benefit to NSW workers</td>
<td>Greenhouse gas emissions</td>
</tr>
<tr>
<td></td>
<td>121.8</td>
</tr>
<tr>
<td>Net economic benefit to NSW suppliers</td>
<td>Visual amenity</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Transport impact</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Net public infrastructure cost</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Surface water impact</td>
</tr>
<tr>
<td></td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Biodiversity impact</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Noise impact</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Loss of surplus to other industries</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td><strong>Total indirect benefits</strong></td>
<td><strong>Total indirect costs</strong></td>
</tr>
<tr>
<td></td>
<td>156.3</td>
</tr>
</tbody>
</table>

| Total economic benefit of project | 1,104 | Total economic cost of project | 156.3 |

| NPV of project - NSW Community | 947    |
| BCR                            | 7.062  |