APPENDIX N
Economic impact assessment

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COWAL GOLD OPERATIONS OPEN PIT CONTINUATION PROJECT – ECONOMIC IMPACT ASSESSMENT

EVOLUTION MINING (COWAL) PTY LTD
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EXECUTIVE SUMMARY

BACKGROUND

Evolution Mining (Cowal) Pty Limited (Evolution) is the owner and operator of Cowal Gold Operations (CGO), an existing open pit and underground (currently being constructed) gold mine approximately 38 kilometres (km) north-east of West Wyalong, in the central west region of New South Wales (NSW).

Evolution is seeking approval for further open pit mining operations at CGO through the Open Pit Continuation Project (the Project). The Project primarily seeks to continue the open pit operations by approximately 10 years to 2036 and extend the total mine life by approximately two years to 2042.

An Environmental Impact Statement (EIS) is required for the proposed development to comply with the requirements in Clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

This Economic Impact Assessment has been developed as a technical document for use in preparing the EIS. The report quantifies the expected beneficial and adverse economic impacts of the Project on the regional and state economies. The report also recommends mitigation strategies to ensure regional economic values are enhanced or, as a minimum, maintained if the Project proceeds.

The most relevant economy against which to examine the regional impacts associated with the Project is the regional economy comprised of Bland, Lachlan and Forbes local government areas (LGAs). This area is referred to as the Catchment.

EXISTING ECONOMIC ENVIRONMENT

The Catchment recorded an estimated resident population of approximately 21,100 in 2021. Similar to many communities in regional NSW, the Catchment's population has been in decline over the past two decades. Various mining and exploration projects have assisted in slowing population decline since 2006 (including the commencement of production at the current Cowal Gold mine in 2006). The Catchment's trend of population decline is anticipated to reverse over the next two decades, with the resident population expected to grow to reach approximately 22,500 residents by 2041.

The Catchment recorded Gross Regional Product (GRP) of approximately $1.5 billion in 2020/21. The economy is heavily influenced by fluctuations in agricultural and mining activity which has contributed to the Catchment's GRP being relatively volatile year to year over the past decade. These industries contributed 24.7% and 11.2% of total Industry Value Add (IVA) activity[1], respectively, in 2020/21. Agriculture was also the largest employing industry in the Catchment in 2020/21, employing 26.7% of the Catchment's total workforce, while mining comprised 5.1% of the total workforce.

The Catchment has had a more volatile unemployment rate than NSW over the past decade, in keeping with the volatility experienced in the two main industries of agriculture and mining over this period. Despite the historical volatility, the Catchment's labour market faced the shock of the COVID pandemic better than the rest of the State, reaching an unemployment height of 4.5% in September of 2020, compared to the State's high of 6.8%. The labour market has since tightened considerably, registering an unemployment rate of 2.4%, as of September 2022 with NSW having a rate of 3.2%. This low level of unemployment in the Catchment is an indicator of very tight labour market conditions currently which may restrict the ability of businesses to find suitable labour in the current market.

The property sales markets in the Catchment experienced strong growth in demand and prices in recent years to 2022, but is showing signs of slowing in late 2022 and early 2023 as rising interest rates and predictions of a global economic slowdown impact the market. Most analysts, including major banks, are predicting the property sales market to continue to slow through 2023. The rental market in the Catchment, on the other hand, has remained strong through 2023 as construction of major projects such as the Wyalong and West Wyalong solar farms have contributed to an increase in demand for rental properties, which has seen rental prices increase substantially and

[1] Industry Value Add is the contribution of an industry to GRP. It excludes the sector of ownership of dwellings as well as taxes less subsidies, which combined with IVA comprise GRP.

vacancy rates plummet as the market tightens. However, as these projects wind up in 2023, combined with the expected property market decline in 2023, it can reasonably be expected that the existing tightness being experienced in the local property market may be short term in nature and not a good indicator of future conditions.

LOCAL EFFECTS ANALYSIS

Potential Beneficial Impacts

Key beneficial impacts arising from the Cowal Gold Operations Open Pit Expansion are outlined in Table ES.1. Beneficial impacts are examined in consideration of what would otherwise occur if the Project does not proceed.

Table ES.1. Assessment of Beneficial Impacts of the Cowal Gold Operations Open Pit Expansion

Impact	Description
Economic Growth	The Project will contribute to economic growth in the Catchment and New South Wales (NSW) economies through increased industry output and Gross Regional/ State Product (GRP/ GSP) during construction and operation (i.e. production), flowing from both direct and flow-on impacts. In total, over the 19-year Project timeline: • The Catchment economy is estimated to record an increase in GRP valued at $666.7 million in present value terms (at a 7% discount rate) relative to what would otherwise be expected to occur without the Project. • The NSW economy is estimated to record an increase in GSP valued at $910.7 million in present value terms (at a 7% discount rate) relative to what would otherwise be expected to occur without the Project (inclusive of the contribution to the Catchment).
Employment	The Project will support jobs in the Catchment and NSW economies during construction and operations, compared to what would occur without the Project, flowing from both direct and flow-on impacts. Over the 19-year Project timeline the Project is estimated to support a total of: • 2,516 full time equivalent (FTE) job years in the Catchment (where one FTE job year is equivalent to one person working full time for a period of one year), averaging 132 FTE jobs per annum with a peak of 245 FTE jobs in Year 5. • 2,045 FTE job years in NSW, averaging 108 FTE jobs per annum with a peak of 210 FTE jobs in Year 5. The lower number of FTE job years supported in NSW than the Catchment reflects an expected retention of jobs in the Catchment due to the Project that would otherwise seek employment elsewhere in NSW without the Project (thus producing a negative value for FTE job years in the rest of NSW).
Household Incomes	The increase in employment will also deliver increased incomes in the Catchment and NSW, both directly as a result of the jobs supported as well as through a small lift in real wages generated by increased competition for labour. Over the 19-year Project timeline the Project is estimated to support a total of: • $181.4 million in additional wages and salaries in the Catchment in present value terms (7% discount rate), with real wages growth of 1.26% per annum on average (i.e., the average employee income is estimated to be 1.26% higher in the Catchment with the Project than would be expected without the Project). • $589.4 million in additional wages and salaries in NSW (inclusive of the Catchment) in present value terms (7% discount rate), with real wages growth of 0.01% per annum on average relative to what would occur without the Project.
Support for Local Businesses	The proponent has in place existing supply contracts and supply chains for CGO operations, supporting local and NSW businesses. The Project will extend the mining activities at CGO, thereby enabling continued support and opportunities for suppliers in the Catchment and NSW that otherwise would be lost, providing additional security and longevity of business incomes (and employment). The Project will also present opportunities to secure new contracts to supply and service the needs of the Project during all phases of the Project. These supply contracts would not be able to be supported without the Project.
Benefits for Short Term Accommodation Providers	It is anticipated that short term accommodation providers will benefit from increased demand during construction to accommodate non-local construction workers, resulting in increased occupancy rates and increased business revenues. During operations the Project is not anticipated to result in any tangible impacts on short term accommodation demand, as the Project reflects an extension of existing mining activities and operating workforce.

Impact	Description
Government Revenue	The Project will provide a lift in State and Australian government taxation revenues through a variety of taxes and duties. The NSW Government is expected to receive approximately $76.0 million in net additional revenue in present value terms (7% discount rate), primarily through royalty payments, over the life of the Project. The Australian Government is estimated to receive approximately than $250.3 million in present value terms (7% discount rate) in various taxes. These additional revenues can be used by government to provide additional infrastructure and services to support business and households throughout Australia and NSW.

Source: AEC.

Potential Adverse Impacts

Key adverse impacts arising from the Cowal Gold Operations Open Pit Expansion are outlined in Table ES.2. Impacts are examined in consideration of what would otherwise occur if the Project does not proceed.

Table ES.2. Assessment of Adverse Impacts of the Cowal Gold Operations Open Pit Expansion

Impact	Description
Impacts on Local Businesses from Competition for Resources	There will be increased competition for labour and resources, leading to inflationary pressure and increased costs to businesses as well as potential difficulties for local businesses attracting and retaining staff. The increase in real wages also highlights the increasing costs to businesses as real wages are higher than the base case throughout the mine life. As a result, some industries are expected to see a small decline in activity and employment relative to the base case (e.g. manufacturing). However, compared to base case (i.e. without the Project) activity, the impacts of the Project on real wages and industry output are estimated to be relatively small, and the Project's impacts primarily reflect the retention and ongoing support of economic activity already delivered by existing operation of CGO into the longer term.
Impacts on Agricultural Productivity	The Project is expected to result in the disturbance of 244.4 ha of land currently used for agricultural activities, with this area temporarily removed from production during the life of the Project but returned to agricultural (grazing) use following Project completion and site rehabilitation. This is estimated to temporarily result in a (maximum) reduction in agricultural productivity per year valued between $97,700 and $100,700, until this land is returned to agricultural production. In addition to the temporary removal of 244.4 ha of land currently used for agricultural activities, the Project will also result in the permanent removal of 785.6 ha of land that is capable of supporting agricultural activities (though is not currently used for this purpose). This represents a potential future opportunity cost to agriculture rather than actual loss.
Impacts on Short Term Accommodation Availability	Construction of the Project is likely to increase demand for short term accommodation in the Catchment which has the potential to adversely impact on the availability of short term accommodation for other uses (e.g. tourism) over this period. However, once occupancy rates return to normalised levels following completion of the Wyalong and West Wyalong solar farm projects, the construction workforce for the Project is not expected to result in demand and occupancy in the Catchment exceeding availability of short term accommodation supply and is thereby not expected to result in a material change in availability of accommodation for other purposes. During operations the Project's workforce (and thereby accommodation requirements) is expected to be in line with existing CGO activities and thereby not result in any increase in demand relative to existing levels.
Impacts on Local Property Market	Due to the relatively short term construction timeframe, it is anticipated that non-local members of the construction workforce would predominantly seek short term accommodation rather than rental accommodation. However, construction workforce may contribute to some pressures on the rental market in the Catchment. Given the relatively modest non-local workforce anticipated to be required and expected completion of the Wyalong and West Wyalong solar projects in 2023 (which have contributed to the current tightness in the Catchment rental market), the impacts of the Project's non-local construction workforce on property and rental prices may reasonably be expected to be less than has been realised in recent years during construction of the two solar projects which had an estimated combined construction workforce of 450 people (Urbis, 2019; NSW Government, 2019). Local property markets are not anticipated to be materially impacted by Project operations beyond existing levels as a key outcome of the Project will be the retention of the existing CGO workforce rather than generation of additional longer term jobs.

Impact	Description
Impacts on Local Infrastructure and Service Provision	Details regarding potential impacts on local infrastructure and services from the Project are examined in the Social Impact Assessment (EMM, 2023a). The Social Impact Assessment outlines that while the Project can be expected to contribute to an extension of CGO's existing impacts on local infrastructure and services, it is not expected to increase demand for local infrastructure and services beyond existing levels in the longer term.

Source: AEC.

MITIGATION STRATEGIES

Economic impacts of the Project are anticipated to be overwhelmingly positive, with minimal adverse economic impacts.

While the potential adverse economic impacts from the Project are assessed to be low, there are some potential areas that should be monitored, and strategies employed to ensure benefits of the Project to the Catchment and NSW are maximised and any potential adverse impacts minimised:

- To maximise local benefits derived from the Project, and consistent with existing policies implemented at CGO, the proponent and contractors engaged by the proponent will be encouraged to source labour locally where possible and practical and provide training opportunities where practical.
- The proponent has long standing relationships with local business and an established supply chain for its existing activities in the Catchment and NSW. To maximise local benefits derived from the Project, the proponent will continue to support local business by utilising these established supply networks and providing sufficient opportunities and information for local business to secure new supply contracts.

The above measures/ strategies are consistent with industry best practice and considered sufficient to address the adverse economic impacts identified in consideration of the relatively low level of magnitude of these impacts. It is not anticipated that any contingency plans will be necessary to manage residual risks.

It should be recognised that these strategies form part of the proponent's Project planning and modelling/ analysis of impacts in this report has been based on these strategies being implemented.

In addition to the above:

- The Project may result in some impacts in terms of additional demand for short term accommodation/ housing in the local area during the construction phase. This impact and proposed mitigations are examined in the Social Impact Assessment (EMM, 2023a), with the mitigation approach primarily focused prioritising local employment of construction workforce, continued engagement with key stakeholders and procurement initiatives that prioritise and incentivise the use of short term accommodation.
- the Agricultural Impact Statement (Minesoils, 2023) outlines that the proponent will continue to employ existing mitigation measures and strategies at CGO to ensure the long term impacts of the Project on agriculture are restricted to the additional disturbance area and minimise impacts on agriculture outside of the identified Project area.

COST BENEFIT ANALYSIS

The cost benefit analysis (CBA) examines the net (or incremental) impacts (benefits and costs) of the Project (the 'Project Case' scenario) compared to a 'Base Case' scenario of what would be expected to occur without the Project. In the CBA, only the incremental difference in activity (benefits and costs) between the Project Case and Base Case scenarios is modelled.

The CBA examined the impacts of the Project across a 100 year modelling timeframe, from financial year ending June 2025 to financial year ending June 2124, incorporating the construction period, the operational life of the Project, decommissioning/ rehabilitation, as well as ongoing impacts to agriculture over 100 years due to the temporary and permanent disturbance of land either currently used or suitable for agriculture due to the Project. All values were discounted back to 2022/23 values.

The following costs and benefits were examined:

- Costs:
  - Construction costs of the Project.
  - Lifecycle/ sustaining capital costs for the Project.
  - Operating and maintenance costs for the Project.
  - Post-mining decommissioning and rehabilitation costs.
  - The biodiversity offset costs related to the Project.
  - The reduction in agricultural productivity due to the Project, over 100 years.
  - The incremental annual change in greenhouse gas (GHG) emissions resulting from the Project.
  - The incremental annual change in travel task and costs related to the Project.
- Benefits:
  - The incremental annual change in value of production/ revenue from the Project.
  - Benefits to labour from additional wages and salaries paid as a result of the Project.

Table ES. 3 below outlines the present value (PV) of the incremental additional costs and benefits associated with the Project Case relative to the Base Case, between the financial year ended June 2025 and financial year ended June 2124, at discount rates of 4%, 7% and 10%.

The Project is estimated to return a Net Present Value (NPV) of $313.8 million over the assessment period (discount rate of 7%) with a Benefit Cost Ratio (BCR) of 1.19. The Project returns a desirable result across each of the discount rates examined, with the BCR ranging between 1.16 (10% discount rate) and 1.23 (4% discount rate). The CBA is insensitive to the discount rate used with minimal change in BCR across discount rates examined. The Project has an internal rate of return (IRR) of 22.7%.

Table ES. 3. Summary of CBA Results

Impact	PV ($M) – 4% Discount Rate	PV ($M) – 7% Discount Rate	PV ($M) – 10% Discount Rate
Costs			
Construction Costs	$83.1	$77.1	$71.7
Lifecycle/ Sustaining Capital Costs	$224.5	$190.8	$164.3
Operating Costs	$1,548.5	$1,199.8	$946.3
Decommissioning/ Rehabilitation Costs	$5.4	$3.1	$1.8
Biodiversity Offset Costs	$35.3	$31.7	$28.6
Impacts to Agriculture	$9.0	$5.3	$3.7
Greenhouse Gas Emissions	$111.9	$88.4	$71.4
Costs of Increased Travel	$20.9	$16.6	$13.4
Total Costs	***$2,038.7***	***$1,612.8***	***$1,301.2***
Benefits			
Value of Gold and Silver Production	$2,443.2	$1,875.2	$1,464.2
Benefits to Labour	$65.2	$51.5	$41.3
Total Benefits	***$2,508.4***	***$1,926.6***	***$1,505.5***
Summary			
Net Present Value (NPV)	**$469.7**	**$313.8**	**$204.3**
Benefit Cost Ratio (BCR)	**1.23**	**1.19**	**1.16**

Source: AEC.

Sensitivity analysis at a discount rate of 7% shows there is a 90% probability the Project will provide an NPV between -$64.9 million and $682.4 million. Sensitivity testing returned a positive NPV across 91.4% of the 5,000 iterations run in Monte Carlo analysis, with the analysis most sensitive to the net operating result (i.e., difference

between value of gold and silver production and operating costs in the table below); the larger the net operating result the larger the NPV. Given and silver gold prices used in the analysis are considerably below current prices the sensitivity analysis is considered likely to overstate the probability of returning a negative NPV.

ABBREVIATIONS, ACRONYMS AND UNITS

Abbreviation/ Acronym/ Unit	Term
Abbreviations/ Acronyms	
Additional disturbance area	The areas that will be disturbed by the Project that are outside of the existing and approved disturbance area.
AEC	AEC Group Pty Ltd
BCR	Benefit to cost ratio
CBA	Cost Benefit Analysis
CGE	Computable General Equilibrium
CGO	Cowal Gold Operations
EIS	Environmental Impact Statement
Evolution	Evolution Mining (Cowal) Pty Limited
Existing and approved disturbance area	Areas that are disturbed and/ or approved to be disturbed under the current development consents that apply to CGO.
FTE	Full time equivalent
FTE job	Full time equivalent job. Equivalent to one person working full time for a period of one year.
FTE job years	Equivalent to the number of FTE jobs required to complete a project in one year, or the number of years one FTE employee would be employed to complete a project.
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GRP	Gross Regional Product
GSP	Gross State Product
GST	Goods and Services Tax
IRR	Internal rate of return
IVA	Industry value added
IWL	Integrated waste landform
LEA	Local Effects Analysis
LGA	Local Government Area
LPB	Lake protection bund
ML	Mining Lease
NPV	Net present value
NSW	New South Wales
PoW	Place of work
Project disturbance area	This area is a combination of the additional disturbance area and the existing and approved disturbance area.
PV	Present value
SEARs	Secretary's Environmental Assessment Requirements
The Project	The Open Pit Continuation Project
The Project application area	The area subject that is the subject of the development application encompassing the Project area, water supply pipeline and Bland Creek Palaeochannel Borefield.
The Project area	Outlines the area at the CGO mine site which is subject to the development application.

Abbreviation/ Acronym/ Unit	Term
Units	
$M	Million dollars
c/km	Cents per kilometre
c/L	Cents per litre
ha	Hectare(s)
kg	Kilogram(s)
km	Kilometre(s)
Mt	million tonne(s)
Mtpa	million tonne(s) per annum
MW	Megawatt(s)
oz	Ounce(s)
t	Tonne(s)
t CO_2-e	Tonne(s) of carbon dioxide equivalent

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1. INTRODUCTION

1.1 BACKGROUND

Evolution Mining (Cowal) Pty Limited (Evolution) is the owner and operator of Cowal Gold Operations (CGO), an existing open pit and underground (currently being constructed) gold mine approximately 38 kilometres (km) north-east of West Wyalong, in the central west region of New South Wales (NSW).

CGO is located on the traditional lands of the Wiradjuri People and is immediately adjacent to the western foreshore of Lake Cowal, which is an ephemeral waterbody. CGO was first approved in 1999, and open pit mining operations commenced in 2005. Underground mining operations were approved in 2021 and development works to enable underground mining are underway.

1.2 PROJECT DESCRIPTION

Evolution is seeking approval for further open pit mining operations at CGO through the Open Pit Continuation Project (the Project). The Project primarily seeks to continue the open pit operations by approximately 10 years to 2036 and extend the total mine life by approximately two years to 2042.

This will involve further development of the existing E42 Pit and the development of open pit mining in three adjacent orebodies, known as the 'E46', 'GR' and 'E41' pits. It is noted that the three adjacent ore bodies are within the existing mining lease (ML) 1535. No change to the approved ore processing rate of 9.8 Million tonne per annum (Mtpa) is proposed.

The Project comprises the following key components:

- The continued operation of activities as approved under DA14/98 and SSD 10367.
- Development of three new open satellite pits (the 'E46', 'GR' and 'E41' pits) to the north and south of the existing open pit, within the current approved mining lease.
- Extending the existing open pit to the east and south via a 'cutback' within the current approved mine lease.
- Extending open pit mining operations by approximately 10 years to 2036 and total mine life by approximately two years to 2042.
- Expansion of the integrated waste landform (IWL) to accommodate life of mine tailings.
- Extension of the lake protection bund (LPB) system to provide continued separation and mutual protection between Lake Cowal and the mine.
- Backfilling of one of the new open satellite pits (E46) with waste rock and establishment of a new waste rock emplacement on the backfilled pit to minimise the additional area required for waste rock disposal.
- Expansion of the footprint of the existing WRE areas to accommodate additional waste rock.
- Development of additional topsoil and subsoil stockpiles to accommodate materials from pre-stripping, with materials to be reused during progressive mine rehabilitation.
- Upgrades to existing surface water drainage system, to assist with on-site water management and maximise on-site water conservation.
- Modification of internal site access and haul roads.
- Development of new water storages and relocation of some components of the surface water drainage system.
- Modification and relocation of some existing auxiliary mining infrastructure.

Other than the changes to existing approved activities as set out above, all activities that are currently approved under existing Ministerial development consents, including existing ore processing rates or methods, tailings disposal methods, main site access, water supply sources or hours of operation are intended to continue. Existing activities approved under the consents are described in Chapter 3 of the Environmental Impact Statement (EIS).

The Project will also retain the existing open pit mining workforce. Further detail on key Project elements relevant to the economic assessment is provided in section 3 of this report.

1.3 PURPOSE OF THIS REPORT

An EIS is required for the proposed development to comply with the requirements in Clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*. As part of the EIS, analysis of the anticipated economic impacts of the Project is required.

This report has been developed as a technical document for use in preparing the EIS. The report quantifies the expected beneficial and adverse economic impacts of the Project on the regional and state economies. The report also recommends mitigation strategies to ensure regional economic values are enhanced or, as a minimum, maintained if the Project proceeds.

1.4 TERMINOLOGY

A summary of key terminology used to describe operations and disturbance areas is provided below. A full list of abbreviated terms is provided in the 'Abbreviations, Acronyms and Units' section of this report:

- **Cowal Gold Operations (CGO)**: Comprises both the existing open pit mine, underground mine, processing facility, IWL, waste rock emplacement areas, ore stockpiles and ancillary infrastructure.
- **The Project area**: Outlines the area at the CGO mine site which is subject to the development application.
- **The Project application area**: The area subject that is the subject of the development application encompassing the Project area, water supply pipeline and Bland Creek Palaeochannel Borefield.
- **Existing and approved disturbance area**: Areas that are disturbed and/ or approved to be disturbed under the current development consents that apply to CGO.
- **Additional disturbance area**: The areas that will be disturbed by the Project that are outside of the existing and approved disturbance area.
- **Project disturbance area**: This area is a combination of the additional disturbance area and the existing and approved disturbance area.

2. ASSESSMENT APPROACH

2.1 ASSESSMENT REQUIREMENTS

This assessment has been prepared in accordance with requirements set out in the Secretary's Environmental Assessment Requirements (SEARs) for the Project. The SEARs identify matters which must be addressed in the EIS and essentially form its terms of reference. Table 2.1 lists individual requirements in the SEARs relevant to this economic assessment and the section in this report where the requirements are addressed.

Table 2.1. SEARs Requirements

Requirement	Section(s) Addressed
General Requirements	
An assessment of the likely impacts of the development on the environment, focusing on the specific issues identified below, including:	
• A description of the existing environment likely to be affected by the development, using sufficient baseline data.	4
• An assessment of the likely impacts of all stages of the development, including likely interactions between the development and any other existing, approved or proposed developments in the vicinity, including any cumulative impacts, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice.	5
• A description of the measures that would be implemented to avoid, mitigate and/or offset residual impacts of the development, including incident management procedures, and the likely effectiveness of these measures, and an assessment of: ○ Whether these measures are consistent with industry best practice, and represent the full range of reasonable and feasible mitigation measures that could be implemented; ○ The likely effectiveness of these measures, including performance measures where relevant; and ○ Whether contingency plans would be necessary to manage any residual risks.	6
An evaluation of the development as a whole, having regard to the […] economic […] costs and benefits of the development.	5 and 7
An estimate of jobs that will be created during the construction and operational phases of the proposed infrastructure	3.1.1.2, 3.1.3.4 and 5.1.3
Key Issues	
Economic – including an assessment of the likely economic impacts of the development, paying particular attention to the:	
• Significance of the resource	5.1
• Costs and benefits of the development for the State and region	5 and 7
• The demand for the provision of local infrastructure and services	5.3.2
• Consideration of the need for a Voluntary Planning Agreement in relation to the demand for the provision of local infrastructure and services	5.3.2

In addition to the SEARs, the *Guidelines for Economic Assessment of Mining and Coal Seam Gas Proposals (December 2015)* have been used as a basis for the scope of assessment required for the economic assessment. These guidelines indicate the following works as being required:

- A cost benefit analysis (CBA) to assess the public interest by estimating the net present value of the Project to the NSW community.
- A local effects analysis (LEA) to assess the likely impacts of the development in the locality / region in which the Project is located.

2.2 METHOD OF ASSESSMENT

2.2.1 Existing Economic Environment

The existing economic environment section provides an overview of the existing economic profile of the Project study area (see section 2.3 for a definition of the Catchment used for the Project study area) based on data available as of March 2023 and provides a current baseline for assessment of the significance of potential impacts of the proposed development. Regional economic data collected during this stage is used to develop economic models and informs the 'base case' (or baseline scenario) against which the Project's impacts are assessed.

A summary of the existing economic environment is presented in section 4, with supporting data in Appendix A.

2.2.2 Local Effects Analysis (LEA)

The LEA section uses economic impact modelling results as well as information from the existing environment and desktop research to analyse, assess and discuss the economic impacts of the Project.

The LEA includes input and information from:

- Economic modelling using Computable General Equilibrium (CGE) modelling techniques (a description of CGE modelling is provided in Appendix B).
- Interpretation of modelling output in the context of the regional and state economies, and analysis of other non-quantified changes to the economic environment.
- Evaluation of the significance of impacts in relation to economic resources.

The assessment identifies the economic impacts specific to the Project compared to what would be anticipated if the Project does not proceed. The LEA is presented in section 5.

2.2.3 Development of Mitigation and Enhancement Strategies

The mitigation strategies section identifies strategies to avoid, reduce or mitigate the negative economic impacts and enhance and facilitate the capture of the positive impacts identified in the economic impact assessment. Mitigation and enhancement strategies are presented in section 6.

2.2.4 Cost Benefit Analysis (CBA)

The CBA has been conducted in line with NSW and Australian Government guidelines, examining the stream of relevant economic, social and environmental costs and benefits anticipated from the Project to assess the net present value of the Project to the NSW community. Additional details regarding the CBA assessment method used is provided in Appendix C. The results of the cost benefit analysis are presented in section 7 of this report.

2.3 STUDY AREA

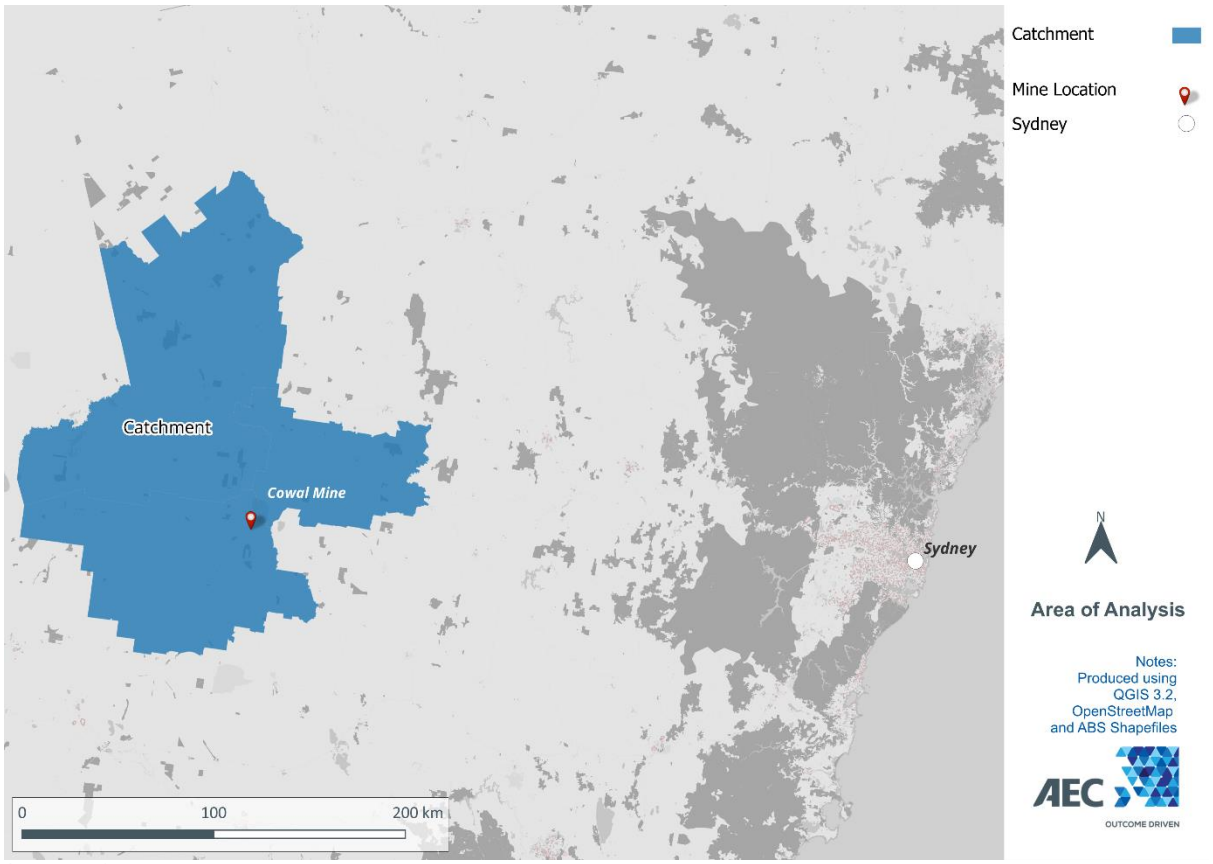
The study area used in the LEA is defined as the aggregation of the following Local Government Areas (LGA):

- Bland LGA (in which the Project is located).
- Lachlan LGA.
- Forbes LGA.

The above study area is hereafter referred to as the "Catchment".

This report uses 2022 LGA boundaries, noting that in September 2019, Murrin Bridge joined Lachlan Shire, representing a shift of approximately 1.9% of Cobar's population into Lachlan (Lachlan Shire Council, 2020; ABS 2020d).

Figure 2.1. Map of Catchment



Source: AEC.

3. PROJECT SCENARIO AND ASSUMPTIONS

3.1 PROJECT SCENARIO

As outlined in section 1.2, the Project will support the extended operations of the CGO. The Project scenario examined only includes the additional activity supported at the CGO due to the Project. Operations of the existing approved deposits through to depletion are not included in assessing the Project impacts, as these activities can occur without the Project.

An overview of Project assumptions and parameters used in undertaking economic modelling and analysis are provided in the following sections.

Timeframes for the Project are presented from Year 1 through to Year 19, reflecting the total years of construction, operations and decommissioning/ rehabilitation anticipated. Year 1 within this timeline reflects the first year of construction activity.

Note: All dollar values presented in this section are in Australian dollar terms unless otherwise specified.

3.1.1 Construction

3.1.1.1 Construction Costs and Timing

Initial construction costs for the Project are estimated to be approximately $92.1 million, occurring over an approximately two-year period, with construction expenditure split approximately 35% in Year 1 and 65% in Year 2.

Note that in undertaking CGE modelling as part of the LEA in section 5, capital cost estimates were based on an earlier version of costs, which used a slightly lower value of $90.5 million. In undertaking the CBA in section 7, the above costs of $92.1 million were used.

In addition to the above initial capital cost, a biodiversity offset cost of approximately $41.2 million has been estimated, of which approximately 65% is estimated to be spent in the first two years of construction, with the remainder in Years 5 to 7.

3.1.1.2 Construction Labour

A total of 134 full time equivalent job years (FTE job years)[2] are estimated to be required during the approximately two-year construction period. Monthly timing for construction labour used in the modelling is outlined in Figure 3.1 below. On an annual basis this equates to the following:

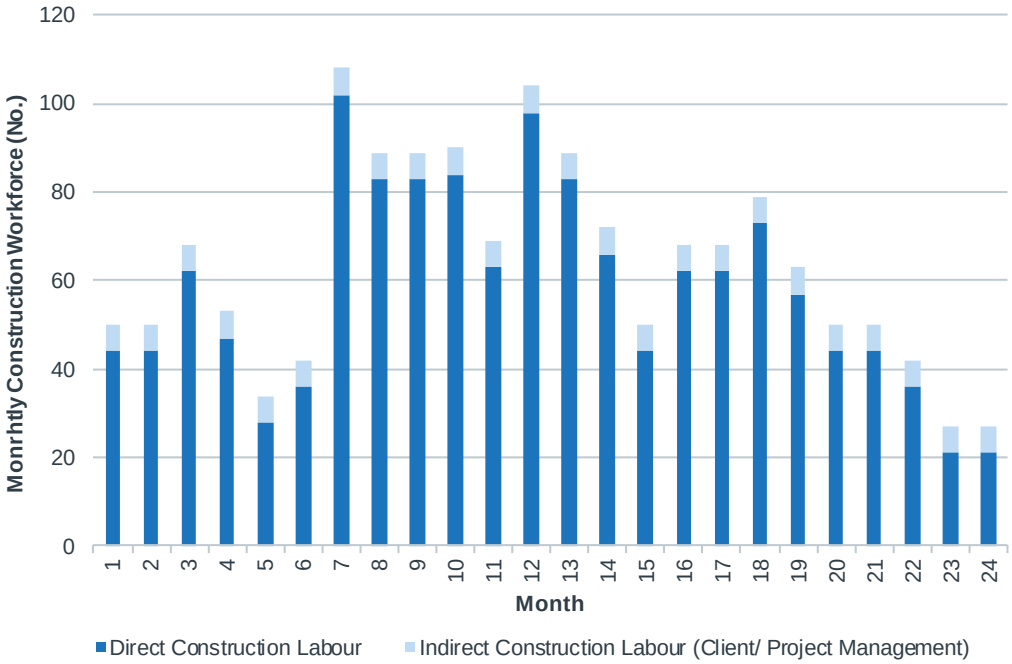
- Year 1: 65 direct FTE jobs and 6 indirect (client/ project management) FTE jobs.
- Year 2: 51 direct FTE jobs and 6 indirect (client/ project management) FTE jobs.

Construction labour costs associated with these workers are included within the capital cost estimates presented in section 3.1.1.1.

Note that in undertaking CGE modelling as part of the LEA in section 5, a 27-month labour force estimate was used based on an earlier version of construction timing. However, the employment numbers used in the final three months were very small and the implications on modelled outcomes presented in section 5 is negligible.

[2] Where one FTE job year is equivalent to one person working full time for a period of one year.

Figure 3.1. Monthly Construction Workforce for Project



Source: Evolution Mining (unpublished).

3.1.1.3 Source of Labour, Goods and Services

Construction will use labour from the Catchment where feasible, with the rest of the construction workforce supplemented by workers outside the Catchment. The economic analysis assumes:

- 40% of labour for direct costs are sourced from within the Catchment, with the remaining 60% being sourced from other regions of NSW.
- 30% of labour for indirect costs (i.e. client costs on project management and delivery) are sourced from within the Catchment, and 70% from other regions of NSW.

The proportion of labour sourced from within the Catchment reflects the limited capacity within the Catchment's labour market. An overview of the existing labour market is provided in section 4 and Appendix A.

For the purposes of the economic impact assessment, assumptions regarding where goods and services for construction will be sourced from were developed collaboratively by AEC and the proponent in consideration of types of goods and services required and capacity within the local economy.

A summary of the assumptions used is presented in Table 3.1.

Table 3.1. Assumed Source of Goods and Services Used During Construction

Component	Catchment	Rest of NSW	Rest of Australia	Overseas
Machinery and Equipment for Earthworks and Demolitions	25%	65%	10%	0%
Water, Power, Sewer and Communications Infrastructure	65%	15%	20%	0%
Bunds	5%	35%	60%	0%
Dams and Water Channels	25%	70%	5%	0%
Other Goods and Services	15%	70%	15%	0%

Source: Evolution Mining (unpublished), AEC.

3.1.2 Lifecycle/ Sustaining Capital

3.1.2.1 Lifecycle/ Sustaining Capital Costs and Timing

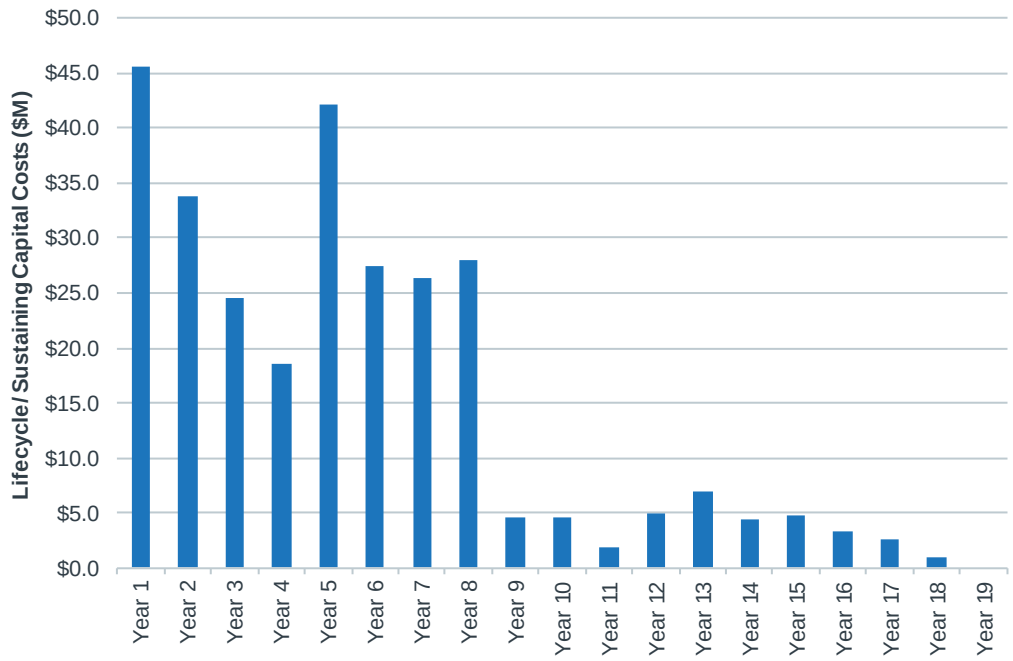
In addition to the initial capital costs for Project development outlined in section 3.1.1, the Project will require additional lifecycle/ sustaining capital investment for CGO beyond what would otherwise be expected without the Project (as a result of the additional infrastructure developed and extension of mining operations resulting from the Project).

In total it is estimated approximately $285 million in additional lifecycle/ sustaining capital will be required as a result of the Project, from Year 1 through to Year 18. The largest components of this expenditure include:

- Extension of the IWL (approximately 35%).
- Purchase and replacement of vehicles (e.g. trucks, dozers, light vehicles) (approximately 25%).
- Topsoil removal for pits and waste dumps (approximately 15%).

Other cost components are primarily related to corrosion remediation, lighting and IT equipment, exploration and general improvements. An indicative timeline for additional lifecycle/ sustaining capital expenditure as a result of the Project is presented in Figure 3.2 below.

Figure 3.2. Additional Lifecycle/ Sustaining Capital Costs Due to Project by Year ($M)



Source: Evolution Mining (unpublished).

3.1.2.2 Lifecycle/ Sustaining Capital Labour

Approximately 15 direct FTE jobs and three indirect (client/ project management) FTE jobs are expected to be supported each year between Year 5 and Year 8 for expansion of the IWL. It should be noted that IWL works represent an activity that is already occurring at the CGO site and the activities included in this assessment of IWL expansion reflect in extension of these activities into the longer term to meet the additional needs of the Project (and thereby the jobs reflect ongoing jobs rather than additional worker requirements compared to existing levels).

For other lifecycle/ sustaining capital expenditure, the labour component is either incorporated in the operations labour (see section 3.1.3.4) or this expenditure will primarily reflect the purchase of machinery and equipment and is not anticipated to require any direct labour.

3.1.2.3 Source of Goods and Services

For the purposes of the economic impact assessment, assumptions regarding where goods and services for lifecycle/ sustaining capital will be sourced from were developed collaboratively by AEC and the proponent in consideration of types of goods and services required and capacity within the local economy.

A summary of the assumptions used is presented in Table 3.2.

Table 3.2. Assumed Source of Lifecycle/ Sustaining Capital Goods and Services Purchased

Component	Catchment	Rest of NSW	Rest of Australia	Overseas
IWL	5%	75%	20%	0%
Geotech Equipment	0%	30%	50%	20%
Road Construction Materials and Equipment	25%	70%	5%	0%
Vehicles and Excavation Equipment	5%	25%	70%	0%
Corrosion Remediation	75%	25%	0%	0%
Lighting and IT Equipment	10%	85%	5%	0%
Exploration	75%	25%	0%	0%
General Improvements	5%	80%	15%	0%
Environmental Monitoring Equipment	0%	30%	70%	0%
Fencing Materials	65%	15%	20%	0%
Other	0%	100%	0%	0%

Source: Evolution Mining (unpublished), AEC.

3.1.3 Operations

3.1.3.1 Production and Timing

The ore mined at CGO produces both saleable gold and silver, however silver production is considered ancillary to gold production in that its contribution to CGO revenue is a very small fraction (approximately 1%) to that of gold (i.e., it is the gold resource which makes existing CGO and the Project economically feasible).

Indicative estimates of the average annual production of gold and silver (to the nearest 1,000 ounces (oz) per annum) from the Project across five year periods is presented in Table 3.3. Note that processing activity is anticipated to continue beyond the period of mining reflecting that the Project will contribute to the development of a stockpile of ore for future processing.

Table 3.3. Project Average Annual Production Rates by Five Year Periods

Product	Years 1 to 5	Years 6 to 10	Years 11 to 15	Years 16 to 19
Mined Ore (Mtpa)	3.7	5.5	3.9	0.0
Processed Ore (Mtpa)	2.2	4.7	4.6	2.0
Saleable Gold Product Produced (oz/annum)	71,000	129,000	107,000	20,000
Saleable Silver Product Produced (oz/annum)	64,000	116,000	96,000	18,000

Source: Evolution Mining (unpublished).

3.1.3.2 Gold and Silver Prices

Gold and silver prices have been estimated based on data from ABC Bullion (2023), which indicates that:

- Gold prices generally rose steadily between the early 2000s to 2012, rising from around $500 per oz to a peak of around $1,800 per oz in 2012. Gold prices then fluctuated between January 2012 and December 2018 between around $1,300 per oz and $1,800 per oz. Since the beginning of 2019 the gold price has risen significantly, peaking at around $3,000 per oz in 2023 and not falling below $2,200 per oz since the beginning of 2020. This has largely been influenced significant global economic uncertainty in the wake of COVID-19 and geo-political tensions.

- Silver prices over the past two decades have generally been relatively stable, interspersed with occasional periods of significant peaks. Between the mid-2000s and 2010, the silver price generally fluctuated between around $15 per oz and $20 per oz. The silver price then spiked in 2011, peaking at around $42 per oz, but then declined sharply over 2012 and 2013 to then fluctuate between around $20 per oz and $25 per oz between 2014 and 2019. As with the gold price, the impacts of COVID-19 and current geo-political tensions have contributed to the silver price lifting to fluctuate between around $30 per oz and $40 per oz since mid-2020.

To be conservative, the economic modelling has been undertaken assuming both gold and silver prices fall from current levels (though remain above historic averages between 2012 and 2019) to an average of around $2,200 per oz for gold and $25 per oz for silver over the life of the Project.

3.1.3.3 Operating Expenditure

Estimates of operating costs and timing over the life of the Project were provided by the proponent. A summary of the average operating expenditure per Mtpa of ore mined/ processed is outlined in Table 3.4. While costs are presented as a rate per tonne of mined/ processed ore over the life of the Project, the actual timing of operating costs varies year to year based on anticipated timing of key activities rather than tonnes of mined/ processed ore.

Table 3.4. Indicative Average Operating Costs per Mtpa of Ore Mined/ Processed

Cost Component	Cost ($M) per Mtpa
Mining and Hauling	$17
Processing	$14
Other Costs/ Overheads	$3
Total	**$34**

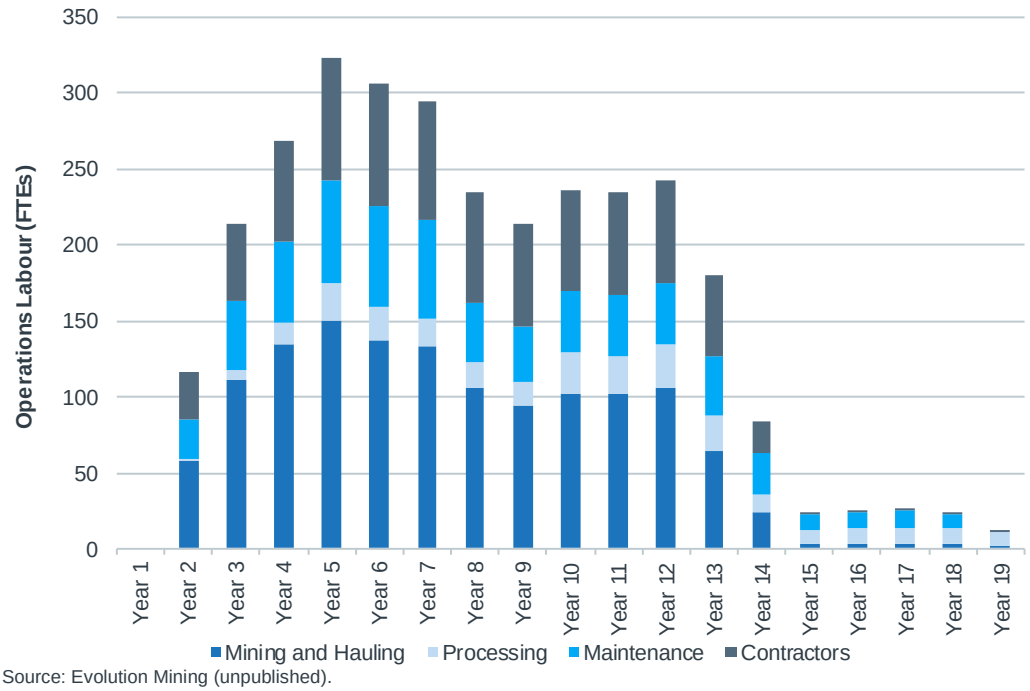
Source: Evolution Mining (unpublished).

3.1.3.4 Operations Labour

The Project will result in the extension of existing mining and processing operations rather than result in a genuine lift in production rates from existing levels. In consideration of this, it is important to recognise that operational employment estimates presented primarily reflect the retention of an existing workforce into the longer term.

Annual estimates of the mining, processing and maintenance operational workforce associated with gold and silver produced by the Project are presented in Figure 3.3 below.

Figure 3.3. Labour Estimates per Annum, Operations (FTEs)



Source: Evolution Mining (unpublished).

Note that in undertaking CGE modelling as part of the LEA in section 5, a slightly higher estimate of contractor labour was used based on an earlier version of operating activity which included a higher estimate of contractor labour for rehandling. However, the contractor labour for rehandling used in the CGE modelling relative to total labour was very small and the implications on modelled outcomes presented in section 5 is negligible.

3.1.3.5 Source of Labour, Goods and Services

CGO will aim to source operational staff for the Project from within the Catchment wherever possible, in line with existing workforce practices. As the Project is primarily anticipated to reflect a retention of the existing workforce it has been assumed the source of labour will be in line with the existing workforce.

Similarly, sourcing of goods and services during operations is anticipated to be in line with existing supply practices.

3.1.4 Post-Mining Decommissioning and Rehabilitation

A total of approximately $11.5 million in decommissioning and rehabilitation expenditure is anticipated, occurring in Year 18 and Year 19. Estimates of labour and non-labour expenditure required for these activities were developed based on standard industry structures within the economic model used. For the purposes of economic analysis, it was assumed the sourcing of labour, goods and services to undertake these works will be approximately in line with the initial construction phase.

3.2 WORKFORCE ACCOMMODATION

The Project will involve a relatively modest labour force requirement during construction as outlined in section 3.1.1.2, of which approximately 70% is anticipated to be sourced from outside the Catchment and thereby require local accommodation. Due to the relatively short term construction timeframe, it is anticipated that non-local members of the construction workforce would predominantly seek short term accommodation rather than rental accommodation. However, as has been the recent experience of the construction workforces associated with the solar farms, there is potential for Project construction to contribute to ongoing pressures on the rental market in the Catchment.

During operations the Project will retain the existing open pit mining workforce as well as the existing processing workforce. The Project is not anticipated to result in an increase in mining workforce relative to existing levels and thereby is not anticipated to result in any change in existing workforce accommodation arrangements.

3.3 CONSEQUENCES OF NOT PROCEEDING WITH PROJECT

Where the Project does not proceed, the economic contribution to be delivered by the Project would not be realised. All economic modelling undertaken in this study (i.e. CGE modelling and cost benefit analysis) presents a comparison of Project impacts against a base case where the Project does not proceed. Both of these analyses present the net change that would occur due to the Project, compared to this base case.

The assumptions used in the base case are presented in Appendix B.

In understanding the implications of the Project not proceeding it is important to note the Project will enable continuation of mining activity in the region. With the Project, mining activity and supply contracts will be delivered in the region, with a retention of activity in the region as production at the current Cowal open cut mine winds down in the next decade.

4. EXISTING ECONOMIC ENVIRONMENT

This section provides an overview of the current economic environment (based on data available as of March 2023) of the Catchment, where impacts of the Project are expected to primarily be felt, with comparisons to New South Wales (NSW) provided where relevant. Additional details of the existing environment are provided in Appendix A.

The following are key attributes of the Catchment's existing environment:

- **The Catchment's population has been in decline for the last two decades:** The Catchment recorded a population of approximately 21,100 in 2021, constituting 0.3% of the total NSW population (ABS, 2022a). The Catchment has experienced a steady decrease in population since the turn of the century (i.e., from 2001 to 2021), with an average annual growth rate of negative 0.7%. This is contrasted by the NSW population growth rate of 1.1% per annum on average over the same period. The Catchment's decline in population slowed in the last decade to negative 0.6%, with positive years of population growth between 2012 to 2014. This period preceded the acquisition of the Cowal mine by the current owner and subsequent periods of high mining volume in the Catchment (Ingram, 2016). The Catchment has since returned to a trend of declining population, exacerbated by drought conditions in 2018 and the COVID-19 pandemic since the beginning of 2020, as the population experienced an annual decrease of negative 0.9% (2019 to 2021) (ABS, 2022a). The COVID restrictions imposed by NSW Mining (in line with State and Australian Government public health advice) likely contributed to this, as a mix of work from home policies and restrictions on visitors and workers from Greater Sydney were implemented (NSWMining, 2021).
- **The Catchment's population is centred in Forbes:** The LGA of Forbes constitutes 44.5% of the Catchment's population, an increase of around 3.0 percentage points from 41.4% in 2001 (ABS, 2022a). The other LGAs in the Catchment, Lachlan and Bland, represent approximately 29.2% and 26.3% of the Catchment's population, respectively. Forbes LGA is likely to continue to increase its share of Catchment population in the near term as approximately 77.3% of 2022 residential building approvals were in the Forbes LGA (ABS, 2022a).
- **The Catchment's population is expected to record positive growth over the next two decades**: The current trend is expected to reverse, with the resident population expected to grow marginally (on average) each year over the subsequent decades from 2021. The Catchment is set to reach approximately 22,500 residents by 2041, an average annual increase of 0.3% on current levels, assuming a moderate growth scenario (NSW DPE, 2022). This is lower than expected population growth for the State of 0.9% per annum on average.
- **The Catchment's economy is showing early signs of resilience:** Estimates of Gross Regional Product (GRP) for the Catchment in 2020/21 was $1.5 billion, in chain-volume terms (AEC, unpublished[a]). This equates to 0.2% of NSW Gross State Product (GSP). The Catchment's GRP generally increased between 2006/7 and 2017/18, with a period of strong growth through the Global Financial Crisis (GFC), followed by an easing of growth through the 2010s. Since 2011 the Catchment has recorded an average annual growth rate of 0.04%, though has fluctuated year to year. The region experienced a drought through most of 2018 (Hatfield-Dobbs, 2018) which affected the productive capacity of the agricultural sector and thereby contributed to a decline in GRP in 2018/19. Despite this, the Catchment experienced resilience through the COVID period as the Catchment recorded average annual growth of 5.3% (AEC, unpublished[a]). This recovery was strong compared to the NSW recovery of 1.4% per annum on average, over the period from 2019/20 to 2020/21.
- **The Catchment's economy (and labour market) is dominated by agriculture:** The Catchment's economy is dominated by agriculture, which constitutes to 24.7% of Industry Value Add (IVA)[3] (2020/21) (AEC, unpublished[a]). Agricultural activity in the Catchment consists of cattle and sheep grazing, with crop production of wheat, barley, oats, lupins, vetch, and canola (Minesoils, 2023). Additionally, agriculture is a significant employer in the Catchment, with agriculture employing over a quarter (26.7%) of the Catchment's workforce.

[3] Industry Value Add is the contribution of an industry to GRP. It excludes the sector of ownership of dwellings as well as taxes less subsidies, which combined with IVA comprise GRP.

- **The Catchment is located on the Lachlan Orogen region, a mining rich area:** The Lachlan Orogen region is naturally rich in gold deposits. The existing Cowal mine, in the Catchment, employ 14.0% of the State's gold miners (ABS, 2022b). Mining activity brings important diversification to the Catchment's economy, as it constitutes up to 11.2% of the Catchment's IVA. Mining is the only industry, other than agriculture, that contributes over 10.0% in IVA. Furthermore, the current mining operations constitute some 5.1% of jobs in the Catchment.
- **There has been strong growth in commodity prices:** There has been substantial growth in the price of gold over the last 20 years, increasing by 8.0% per annum (ABC Bullion, 2022). Much of this growth occurred after the GFC. The commodity market was bullish during the COVID recession, increasing 9.5% per annum during the period 2019 to 2022. The price for gold has reached approximately $3,000 per ounce in early 2023 (ABC Bullion, 2023). The rising price for gold has also been supported by several nations imposing sanctions on the export of Russian-mined gold, which has decreased global supply (Psaledakis, 2022).
- **The Catchment is currently expanding gold production:** Production at the end of the 2021 financial year was 210,847 ounces at CGO (Ballard, 2021). The expansion of the underground mine at Cowal is expected to increase production by 35%, further increasing the specialisation of the Catchment in gold mining. The sanctions on Russian-mined gold outlined above may also present an opportunity for Australian gold producers to capture some of the market share vacated by the reduction in supply of Russian gold.
- **The labour market has typically been more volatile than the State over the past decade, though remained resilient throughout the COVID pandemic:** The Catchment's unemployment rate has been more volatile than that of the State over the decade to 2019, spiking at 7.5% and 5.9% in September 2015 and December 2018 (Jobs and Skills Australia, 2023; ABS 2023a). In the middle of this period the unemployment rate fell to 3.8% in December 2017 and March 2018. This volatility is typical in small catchments, especially those with cyclical activity such as mining and agriculture. Despite the historical volatility, the Catchment's labour market faced the shock of the COVID pandemic better than the rest of the State, reaching an unemployment height of 4.5% in September of 2020, compared to the State's high of 6.8%. The labour market has since tightened considerably, registering an unemployment rate of 2.4%, as of September 2022 with NSW having a rate of 3.2%. This low level of unemployment in the Catchment is an indicator of very tight labour market conditions currently which may restrict the ability of businesses to find suitable labour in the current market.
- **The Catchment is somewhat self-reliant and self-sufficient:** The Catchment is 88.9% self-sufficient, which indicates that the majority of jobs are filled by locals. The largest importer of labour, by percentage, is mining with 29.7% of the work force imported. The Catchment has a high self-containment rate (91.4%), reflecting that the majority of residents of the Catchment found suitable work in their region of residence, or relocated to the region for work purposes.
- **Income inequality (poverty) has reduced in the Catchment:** Since 2011, the proportion of families that live on or under the individual poverty line (the Salvation Army approximates around $400/ week) has reduced from 5.6% to 2.3%, to be in line with NSW average 2.2% (ABS 2022b). This trend continued throughout the economic downturn created by the COVID pandemic and supply-chain disruptions. This demonstrates that the Catchment has access to stable jobs and public services.
- **Property value growth has declined in the Catchment more recently:** The median property price in the Catchment remains significantly below that of the State, largely driven by the location in Central NSW (Dept. of Communities and Justice, 2022). Since 2018, the Catchment's property market has had an average annual increase of 6.9% compared to the 7.4% experienced by NSW. These markets have, however, experienced two different paths over this time:
    - The LGAs of Bland and Forbes experienced significant growth in 2020, 38.9%, in between years of limited growth, with negative growth of 7.9% in 2021. The LGA of Lachlan, whilst not recording any data for 2020, experienced a similar growth rate of 38.2% per annum across the 2019 to 2021 period, as well as a similar contraction in 2022. The growth experienced in 2020 is in line with the average increases across Central and Western NSW, caused by the alleviation of drought conditions in the region (Rural Bank, 2022). Furthermore, COVID saw an exodus of people from the cities into rural areas (Terzon, 2021).

- By comparison, NSW has experienced continual and increasing growth after negative growth in 2019 (Dept. of Communities and Justice, 2022). The most substantial increase was in 2022, with median property prices increasing by 17.6% state-wide, indicative of the wider post-COVID housing boom in Australia. The Catchment has not experienced the same housing boom (Dept. of Communities and Justice 2022).

- **Residential building approval values in the Catchment recorded strong growth in 2022:** The volume and value of residential building approvals has fluctuated over the last five years, with both having strong years in 2018 before decreasing in 2019 and 2020. The volume and valuation of residential approvals bounced back in 2021, with the valuation of approvals at $30.8 million dollars, 92.8% higher than the previous year. Volume of residential approvals increased by 40% in the same period. The drastic increase in value is likely the result of supply chain shortages making input goods such as wood and steel more expensive. Domestic supply of lumper has decreased with the 2019/20 bushfires burning 130,000 hectares of plantation forests (Macau, 2022). Internationally, COVID restrictions induced a reduction in supply and, combined with increased demand, caused lumber prices to skyrocket (Zanello, 2023). Furthermore, the cost of steel increased drastically at the same time (Macau, 2022). Supply was restricted by pandemic related limits to production, as well as the war in Ukraine, with Russia and Ukraine being a significant producer of steel, especially to European markets (Spence, 2022). These factors resulted in increased input costs for builders which can explain the sudden increase in valuation. The Catchment experienced minimal non-residential building activity over the period.

- **Rental costs have increased across the Catchment:** Whilst the Catchment followed the State increase in rent between 2011 and 2016 (approximately 4.0%), the Catchment's rental market activity has increased drastically over the second half of the last decade (ABS, 2022b). Average rent in the Catchment has increased from $159 to $222 over the last five years, an increase of 7.0%, indicative of a tight rental market with few vacancies. The demand for rental properties has been influenced by an influx of construction workers engaged on major projects in the Catchment such as the Wyalong and West Wyalong solar farms. Meanwhile, NSW has only had an increase of 2.3%. Despite this, rental costs in the Catchment are still significantly lower than the State average of $449.

- **Property market projected to slow:** While property prices and rents in the Catchment have increased in recent years, in line with property markets across NSW and Australia, recently this growth has slowed. This slowdown has been caused by considerable uncertainty regarding how the property market will react over the next few years in response to rising inflation and interest rates, and predictions of an economic slowdown in Australia and globally (RBA, 2022; DAE, 2023). These concerns follow significant economic upheaval driven by factors such as COVID-19 and global conflict. Most analysts, including major banks, are predicting housing prices to fall considerably across Australia in 2023 (The Property Tribune, 2022; AFR, 2023; Forbes, 2023). Over time it should be expected that the Australian economy and property markets return to more normalised growth patterns as economies recover from the impacts of recent major events. The expected property market decline in 2023 is likely to be compounded in the Catchment by the completion of major projects in the Catchment, reducing the demand for rental properties by construction workforces. In consideration of the expected property market decline in 2023, reduced rental demand, and subsequent gradual return to normal market cycles, it can reasonably be expected that the existing tightness being experienced in the local property market may be short term in nature and not a good indicator of future conditions.

5. LOCAL EFFECTS ANALYSIS

The following section examines the economic impacts of the Project within the Catchment (local effects analysis), as well as impacts to the State of NSW for context. Impacts within more localised areas within the Catchment as well as Australia are also examined where relevant and appropriate.

This analysis uses economic modelling as well as findings from the literature review and existing environment to inform the assessment of economic impacts as appropriate. **All modelling outcomes are presented in 2022 Australian dollar values** unless otherwise specified. Where values are presented in present value terms, Year 1 has been modelled as the 2024/25 financial year (and so on) for the purposes of discounting.

Note:

In undertaking economic modelling, all years are presented from Year 1 to Year 19 of Project activity rather than specific financial or calendar years, reflecting that timeframes for Project commencement remain uncertain. However, it can be reasonably assumed that the Project will not commence prior to 2025.

As discussed in section 4, the Catchment, State and national economy is currently experiencing some tightness and price increases across a number of markets including supply chains, labour markets and property markets, with these impacts attributable to lingering impacts from COVID and global conflicts as well as construction of some major projects in the Catchment such as the West Wyalong Solar Farm and the Wyalong Solar Farm. However, given the timeframes for the Project, with commencement unlikely prior to 2025, it can reasonably be expected that most of the current market tightness will have alleviated by the time the Project commences and the domestic and global economies returned to more 'normalised' conditions such as those experienced for the majority of the two decades prior to COVID.

In consideration of this, the Local Effects Analysis has been undertaken assuming current tight market conditions are no longer in effect.

5.1 MODELLED ESTIMATES OF CONTRIBUTION TO THE ECONOMY

The Project will contribute to the Catchment and NSW economies by supporting business/ industry output, gross product, jobs and employee incomes, both:

- Directly, through construction activity, the extraction and processing of gold/ silver during operations, and decommissioning activity.
- Indirectly, through flow-on impacts from additional demand for goods and services to support the Project, household consumption effects as a result of additional wages and salaries paid, and government expenditure through additional taxation revenues.

The following sub-sections examine the Project's impact on the Catchment and NSW economies during construction, operations and decommissioning, as estimated using CGE modelling. Modelling of impacts to the rest of Australia were also undertaken using CGE modelling but have not been reported as the vast majority of domestic impacts from the Project are estimated to occur within NSW.

The modelling outcomes identified throughout this section depict the value and percent change in a range of economic indicators anticipated as a result of the Project. These estimates represent the net change in the respective indicators compared to projected growth in the Catchment (and State) economy without the Project proceeding.

The direct activity associated with each phase (construction, operations and decommissioning) is outlined in section 3.1. CGE modelling outlines how this direct activity will deliver impacts to the Catchment and NSW economies both directly and through flow-on activity (e.g. supply chain impacts as well as increased consumption by households). However, CGE modelling does not examine separate phases of Project activity (e.g. construction versus operations) or disaggregate impacts between direct and flow-on activity; rather it examines the direct and flow-on impacts of the Project in aggregate across all relevant phases of the Project lifecycle each year.

Given the above it is not possible to separate out impacts from modelling by the different phases of activity beyond the direct activity for each phase outlined in section 3.1. All modelling results have thereby been examined across all phases in aggregate by year.

Additional details of the CGE model and general assumptions used is provided in Appendix B.

Economic activity supported by the Project has been estimated across the following measures:

- Output. Output as a measure of economic activity refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product.
- Gross regional/ state product (GRP/ GSP). Refers to the value of output after deducting the cost of goods and services inputs in the production process. Gross product thereby defines the true net economic contribution of the Project, whilst estimates of industry output represent the overall increase in economic transactions, and thereby, industry production and activity.
- Employment/ jobs. Refers to the part-time and full-time employment positions generated by the Project, both directly and indirectly through flow-on activity, and is expressed in terms of full time equivalent (FTE) positions.
- Incomes/ wages and salaries. Measures the level of wages and salaries (and other incomes) paid to employees of the industry under consideration and to other industries benefiting from the Project. Impacts on the real wage (i.e. movements in average wages and salaries over time excluding inflation) have also been estimated.

In interpreting the modelling results, the following should be noted:

- The data used to inform the modelling reflects the difference in mining activity at the CGO with and without the Project. Without the Project there will still be mining activity that occurs from the existing open cut operations as well as an approved underground mine, however, resource extraction from these other deposits will be brought forward and overall resource extraction from CGO will be expected to be depleted sooner than would occur with the Project.
- The Project represents the extension of an existing mine that currently supports mining activity and employment. The Project will thereby support the continuation of mining activity and jobs, while the scenario without the Project reflects a scenario where this mining activity and jobs would be lost to the economy.

The impacts displayed should thereby largely be considered the level of economic activity and jobs that are retained in the Catchment and NSW as a result of the Project that would otherwise be lost, rather than additional to existing levels of activity.

5.1.1 Impacts on Gross Regional and State Product

Modelling outcomes of the impacts of the Project on Catchment GRP and NSW GSP between the commencement of construction through to the decommissioning (Year 1 to Year 19) are presented in Table 5.1.

The contribution to NSW GSP is estimated to average just under $70 million over the first five years representing the two year construction period as well as first four years of operation, in which operating activity gradually increases. The contribution to the Catchment's GRP is estimated to average $46.3 million per annum over this period, reflecting a contribution of 2.1% per annum to total GRP in the Catchment.

Between years 6 and 15 the Project is estimated to average a contribution of more than $100 million per annum to the Catchment's GRP and more than $135 million to NSW GSP. This is estimated to represent a contribution of more than 4% of total Catchment GRP over these ten years on average, and between 0.01% and 0.02% of total NSW GSP.

The final four years of the Project (Year 16 to Year 19) reflects post-mining activity including processing of stockpiles generated by the Project as well as decommissioning/ rehabilitation. Over this period the Project's contribution to Catchment GRP is estimated to be $3.6 million per annum on average, with a contribution to NSW GSP of $14.6 million per annum.

Table 5.1. Average Annual Impact on GRP / GSP in the Catchment and NSW by Five Year Period, Deviation from the Base Case

Indicator	Years 1 to 5	Years 6 to 10	Years 11 to 15	Years 16 to 19
Average Annual Catchment GRP ($M)	$46.3	$104.0	$107.7	$3.6
Average Annual Rest of NSW GRP ($M)	$22.3	$33.5	$28.5	$11.0
Average Annual NSW GSP ($M)	$68.6	$137.5	$136.2	$14.6
Average Annual % Change in Catchment GRP	2.10%	4.37%	4.17%	0.13%
Average Annual % Change in NSW GSP	0.01%	0.02%	0.01%	0.00%

Source: Prime Research (unpublished).

In total, between Year 1 and Year 19:

- The Catchment economy is estimated to record an increase in GRP of $1.30 billion relative to what would otherwise be expected to occur without the Project, with a present value of $666.7 million (at a 7% discount rate).
- The NSW economy is estimated to record an increase in GSP of $1.77 billion relative to what would otherwise be expected to occur without the Project (inclusive of the contribution to the Catchment), with a present value of $910.7 million (at a 7% discount rate).

5.1.2 Impacts on Industry Output

Modelling outcomes of the average annual impacts of the Project on industry output in the Catchment and NSW between the commencement of construction through to the decommissioning (Year 1 to Year 19) are presented in Table 5.2.

On average, between Year 1 and Year 19, the Project is estimated to deliver the following annual impacts on industry output:

- The Catchment is estimated to record an increase of $184.2 million per annum in industry output relative to what would otherwise be expected to occur without the Project.
- NSW is estimated to record an increase of $154.4 million per annum in industry output relative to what would otherwise be expected to occur without the Project (i.e. approximately $30 million in industry output per annum less in the rest of NSW than what would be expected to occur without the Project). Notably, while industry output in the rest of NSW is expected to contract, the contribution to GRP in the rest of NSW is projected to increase (see section 5.1.1), reflecting the Project will attract activity to higher value adding industries.

As expected, impacts on industry output are anticipated to be highest for the mining industry in both the Catchment and NSW, averaging $177.6 million per annum in the Catchment and $170.5 million in NSW. This reflects the direct mining activities supported by the Project. The next largest increases in industry output are estimated to be:

- The construction industry ($18.8 million per annum in the Catchment, $22.2 million in NSW), primarily reflecting direct activities associated with initial construction activities as well as ongoing works during Project operations.
- Business services ($6.0 million per annum in the Catchment, $22.3 million in NSW), reflecting a combination of demand for business services to supply the Project during construction and operations as well as flow-on demand for business services throughout the supply chain.

While overall the Project will deliver an increase in industry output, both directly and through flow-on activity, some industries are expected to record lower levels of industry output relative to what would otherwise occur in the base case (without the Project). This lower level of activity from the base case for some industries is largely a reflection of factors such as competition for constrained labour resources and increased costs of businesses as competition for resources drives input prices up (including labour, see section 5.2.2.1). The manufacturing industry is expected to experience the largest adverse impacts from the Project in terms of lower levels of industry output compared to what would be expected to occur without the Project. The manufacturing industry provides a lot of similar skills as used in construction and mining and typically operates in global markets competing with international producers, making it a price taker with limited capacity to increase price to accommodate rising input costs without losing

market share. It should be noted that while the manufacturing industry is estimated to experience lower levels of industry output compared to what would otherwise occur, the contraction in percentage terms is small (0.03% in NSW) relative to the overall size of the industry.

On a percent basis, the mining industry will have the largest industry output change, increasing by nearly 40% in the Catchment on average per annum relative to what would otherwise occur without the Project. As the Project reflects a continuation of existing activity (while the base case/ without the Project reflects an assumption that the CGO would cease extraction sooner and mining would decline in the region), the percent change outlined should be interpreted as the proportion of mining industry output that would be lost to the Catchment and NSW economy between Year 1 and Year 19 without the Project.

Table 5.2. Average Annual Impact on Industry Output by Industry in the Catchment and NSW, Year 1 to Year 19, Deviation from the Base Case

Industry	Catchment	NSW
Change in Industry Output ($M)		
Agriculture, forestry & fishing	-$2.5	-$4.7
Mining	$177.6	$170.5
Manufacturing	-$11.9	-$48.3
Electricity and water	-$1.8	-$8.8
Construction	$18.8	$22.2
Trade[1]	-$0.1	$5.8
Transport and storage	-$3.3	-$7.9
Communication[2]	-$0.3	-$4.2
Finance and insurance	-$0.4	-$6.1
Business services[3]	$6.0	$22.3
Public services, health and education[4]	$0.8	$5.4
Recreation and other services[5]	-$0.1	-$0.5
Ownership of dwellings	$1.2	$8.6
Total Change ($M)	**$184.2**	**$154.4**
Change in Industry Output (%)		
Agriculture, forestry & fishing	-0.21%	-0.02%
Mining	39.17%	0.27%
Manufacturing	-3.88%	-0.03%
Electricity and water	-2.57%	-0.01%
Construction	6.63%	0.01%
Trade[1]	-0.02%	0.00%
Transport and storage	-1.72%	-0.01%
Communication[2]	-0.71%	-0.01%
Finance and insurance	-0.55%	0.00%
Business services[3]	3.42%	0.02%
Public services, health and education[4]	0.17%	0.00%
Recreation and other services[5]	-0.13%	0.00%
Ownership of dwellings	0.44%	0.01%
Total Change (%)	**4.54%**	**0.01%**

Note: (1) Includes wholesale trade, retail trade, accommodation and food services. (2) Includes postal and courier services and telecommunication services; (3) Includes services to mining, property and business services, professional services, administrative services and personal / household goods hiring. (4) Includes public administration, defence, education and training, health care and social services. (5) Includes arts, recreation services, gambling services and other services.
Source: Prime Research (unpublished).

5.1.3 Impacts on Employment

By supporting the ongoing operation of the CGO, the Project will result in the retention of jobs in the Catchment and NSW, both directly and through flow-on activity, that would otherwise be lost without the Project. A summary of modelling outcomes of the Project on employment in the Catchment and NSW between the commencement of construction through to the decommissioning (Year 1 to Year 19) are presented in Table 5.3.

Overall, between Year 1 and Year 19, the Project is estimated to support a total of:

- 2,516 FTE job years[4] in the Catchment, averaging 132 FTE jobs per annum with a peak of 245 FTE jobs in Year 5.
- 2,045 FTE job years in NSW, averaging 108 FTE jobs per annum with a peak of 210 FTE jobs in Year 5. The lower number of FTE job years supported in NSW than the Catchment reflects an expected retention of jobs in the Catchment due to the Project that would otherwise seek employment elsewhere in NSW without the Project (thus producing a negative value for FTE job years in the rest of NSW).

In percent terms, the peak year of employment (Year 5) is estimated to result in total employment in the Catchment being 2.12% higher than would be anticipated to occur without the Project, and 0.006% higher in NSW.

Table 5.3. FTE Job Years Supported in the Catchment and NSW, Year 1 to Year 19, Deviation from the Base Case

Indicator	Total FTE Job Years[1]	Average Annual FTE Jobs	Peak Annual FTE Jobs[2]	Peak Year
Catchment Employment (FTEs)	2,516	132	245	Year 5
Rest of NSW Employment (FTEs)	-470	-25	-48	Year 9
NSW Employment (FTEs)	2,045	108	210	Year 5
% Change in Catchment FTEs	N/A	1.12%	2.12%	Year 5
% Change in NSW FTEs	N/A	0.003%	0.006%	Year 5

Note: (1) An FTE job is equivalent to one person working full time for a period of one year. An FTE job year is used as an equivalence measure of the total number of FTE jobs that would be required to complete an activity in one year, or, the number of years it would take one FTE employee to complete an activity. (2) Where the total FTE job years is positive, this reflects the largest annual increase in FTE jobs; for a negative total FTE job years this reflects the largest annual decrease in FTE jobs.
Source: Prime Research (unpublished).

A breakdown of the average annual employment impacts from the Project between Year 1 and Year 19 by industry in the Catchment and NSW is presented in Table 5.4.

As can be expected, the mining industry is estimated to record the largest average annual increase in jobs as a result of the Project, averaging 154 additional FTE jobs per annum in the Catchment and 138 additional FTE jobs per annum in NSW. Business services is estimated to record the next largest increase in employment in both the Catchment (13 FTE jobs per annum) and NSW (53 FTE jobs per annum).

The NSW manufacturing industry is estimated to record the largest decline in employment due to the Project (contraction of 69 FTE jobs per annum in NSW) relative to what would otherwise be expected to occur in the base case, which can largely be attributed to workers in this industry having a similar skillset to the Project (and thereby transferring from the manufacturing industry to the mining and construction industries).

On a percent basis, the mining industry is estimated to record an increase in employment in the Catchment of 26.9% relative to what would otherwise occur without the Project, and 0.30% in NSW. As with industry output, the percent change outlined should be interpreted as the proportion of mining industry employment that would be lost to the Catchment and NSW economy between Year 1 and Year 19 without the Project.

[4] An FTE job is equivalent to one person working full time for a period of one year. An FTE job year is used as an equivalence measure of the total number of FTE jobs that would be required to complete an activity in one year, or, the number of years it would take one FTE employee to complete an activity.

Table 5.4. Average Annual Impact on Employment (FTEs) by Industry in the Catchment and NSW, Year 1 to Year 19, Deviation from the Base Case

Industry	Catchment	NSW
Change in Employment (FTEs)		
Agriculture, forestry & fishing	-10	-19
Mining	154	138
Manufacturing	-21	-69
Electricity and water	-3	-9
Construction	7	10
Trade[1]	0	19
Transport and storage	-11	-31
Communication[2]	-1	-6
Finance and insurance	0	-4
Business services[3]	13	53
Public services, health and education[4]	4	24
Recreation and other services[5]	0	0
Ownership of dwellings	0	0
Total Change (FTEs)	**132**	**108**
Change in Employment (%)		
Agriculture, forestry & fishing	-0.21%	-0.021%
Mining	26.94%	0.303%
Manufacturing	-4.74%	-0.032%
Electricity and water	-3.25%	-0.027%
Construction	1.32%	0.003%
Trade[1]	0.01%	0.003%
Transport and storage	-4.11%	-0.022%
Communication[2]	-0.55%	-0.003%
Finance and insurance	-0.30%	-0.002%
Business services[3]	2.68%	0.012%
Public services, health and education[4]	0.16%	0.002%
Recreation and other services[5]	-0.06%	0.000%
Ownership of dwellings	0.00%	0.000%
Total Change (%)	**1.12%**	**0.003%**

Note: (1) Includes wholesale trade, retail trade, accommodation and food services. (2) Includes postal and courier services and telecommunication services; (3) Includes services to mining, property and business services, professional services, administrative services and personal / household goods hiring. (4) Includes public administration, defence, education and training, health care and social services. (5) Includes arts, recreation services, gambling services and other services.
Source: Prime Research (unpublished).

5.1.4 Impacts on Wages and Salaries

The retention of jobs due to the Project will result in additional incomes in the Catchment and NSW relative to what would occur without the Project, both directly as a result of the jobs supported as well as through a small lift in real wages generated by increased competition for labour.

Modelling outcomes of the impacts of the Project on the Catchment and NSW employee incomes (i.e. wages and salaries) between Year 1 and Year 19 indicate:

- A total of $330.7 million in additional wages and salaries are estimated to be paid to employees in the Catchment, averaging $17.4 million per annum, with a present value of $181.4 million (at a 7% discount rate). Real wages growth of 1.26% per annum on average is estimated over the 19 years, indicating that the average employee income is estimated to be 1.26% higher in the Catchment with the Project than would be expected without the Project.
- A total of $1.08 billion in additional wages and salaries are estimated to be paid to employees in NSW (inclusive of the Catchment), averaging $56.9 million per annum, with a present value of $589.4 million (at a 7% discount

rate). Real wages growth of 0.01% per annum on average is estimated across NSW relative to what would occur without the Project.

Table 5.5. Annual Increase in Employee Incomes (Wages and Salaries) and Real Wages Growth, Year 1 to Year 19, Deviation from the Base Case

Indicator	Average Annual Incomes Paid ($M)	Total Incomes Paid ($M)	Present Value of Incomes Paid ($M) – 7%	Average Annual Real Wages Growth (%)
Catchment	$17.4	$330.7	$181.4	1.26%
NSW	$56.9	$1,080.6	$589.4	0.01%

Source: Prime Research (unpublished).

5.2 IMPACTS TO BUSINESS

5.2.1 Beneficial Impacts

5.2.1.1 Benefits to Business Upstream in the Supply Chain

The proponent has in place existing supply contracts and supply chains for CGO operations, supporting local and NSW businesses. The Project will extend the mining activities at CGO, thereby enabling continued support and opportunities for suppliers in the Catchment and NSW that otherwise would be lost, providing additional security and longevity of business incomes (and employment). The Project will also present opportunities to secure new contracts to supply and service the needs of the Project during all phases of the Project. These supply contracts would not be able to be supported without the Project.

5.2.1.2 Benefits to Short Term Accommodation Providers

Construction of the Project is estimated to require an average of 71 FTE jobs in Year 1 and a peak workforce of approximately 108 workers (including direct construction workers as well as client/ project management workforce) and an average of 57 FTE jobs and a peak of 89 workers in Year 2 (see section 3.1.1.2). Of this construction workforce it is indicatively estimated approximately 70% may be sourced from outside the Catchment (see section 3.1.1.3) and require local accommodation.

Due to the relatively short term construction timeframe, it is anticipated that non-local members of the construction workforce would predominantly seek short term accommodation in major townships in the Catchment rather than rental accommodation.

It is anticipated that short term accommodation providers will benefit from increased demand, resulting in increased occupancy rates and increased business revenues. As such, construction of the Project will benefit short term accommodation providers through increased demand, resulting in increased occupancy rates and increased business revenues. During operations the Project is not anticipated to result in any tangible impacts on short term accommodation demand, as the Project reflects an extension of existing mining activities and operating workforce.

Potential adverse impacts in terms of short term accommodation availability is examined in section 5.2.2.3, while potential impacts on rental housing market from the construction workforce is examined in section 5.4.

5.2.2 Adverse Impacts

5.2.2.1 Impacts on Business from Competition for Resources

While the Project will provide opportunities for businesses within the mining supply and value chain, some businesses and industries may be adversely impacted by the Project. The modelling results presented in sections 5.1.2 (industry output impacts) and 5.1.3 (employment impacts by industry) highlight that some sectors of the economy are expected to record lower levels of industry output and employment relative to what would otherwise be expected to occur without the Project.

This reflects that mining projects typically compete with industries such as manufacturing for labour as these industries have similar skill sets, which can drive up costs for labour in these industries. The Project can also lead to increases in other costs of business as competition for goods and services drives input prices up.

While some sectors are expected to experience lower levels of activity relative to what would otherwise be expected to occur without the Project, these contractions are small relative to overall industry size and unlikely to be noticeable in the context of existing market conditions. It should also be understood that:

- The Project delivers an increase in industry output and employment in aggregate, relative to what would otherwise occur without the Project.
- The Project's estimated impacts primarily reflect the ongoing support of economic activity already delivered by existing operation of CGO, and the change presented in modelling is an estimate of what would be lost without the Project.

5.2.2.2 Impacts on Agricultural Productivity

The Agricultural Impact Statement (Minesoils, 2023) outlines the Project is expected to result in the disturbance of 244.4 ha of land currently used for agricultural activities. This area will be temporarily removed from production during the life of the Project but will be returned to agricultural (grazing) use following Project completion and site rehabilitation. This is estimated to temporarily result in a (maximum) reduction in agricultural productivity per year valued between $97,700 and $100,700 (see Table 5.6), depending on the activity[5], until this land is returned to agricultural production.

It should be noted though that there is potential that some of the estimated maximum loss in agricultural productivity value could be mitigated through employing higher carrying capacities on other lands not impacted by the Project.

Table 5.6. Estimated Permanent Agricultural Productivity Impact

Type of Enterprise	Estimated Gross Margin ($/ha/year)	Project Disturbance Area (ha)	Gross Margin ($/ Year)
Merino Ewes (20 micron) – Merino Rams	$399.75	244.4	$97,700
Growing-out Steers 240 – 460kg	$412.04	244.4	$100,700

Source: Minesoils, 2023, AEC.

In addition to the temporary removal of 244.4 ha of land currently used for agricultural activities, the Project will also result in the permanent removal of 785.6 ha of land that is capable of supporting agricultural activities (though is not currently used for this purpose). This represents a potential future opportunity cost to agriculture rather than actual loss. Based on the gross margins outlined in Table 5.6 the opportunity cost to agriculture from removal of this land is estimated to be between $314,000 and $323,700 per annum.

The Agricultural Impact Statement (Minesoils, 2023) also outlines there are a range of upstream and downstream sectors and jobs associated with agricultural production in the Catchment that may be indirectly impacted through changes in agricultural production arising from the Project, including:

- Agronomy services.
- Providers of goods and services to agriculture as intermediate inputs (e.g., chemical, fertilisers, etc).
- Machinery sales and mechanical support.
- Grain and livestock transport providers.
- Production marketing.
- Fencing, harvest and other contractors.

[5] Based on gross margin analysis, noting this refers to the potential reduction in agricultural gross margins (i.e. profits), not total value of production.

For additional details regarding the impacts on agriculture refer to the Agricultural Impact Statement (Minesoils, 2023).

5.2.2.3 Impacts on Short Term Accommodation Availability

As outlined in section 5.2.1.2, construction of the Project is likely to increase demand for short term accommodation in the Catchment. While this will represent a positive impact for short term accommodation providers during the construction period, it also has the potential to adversely impact on the availability of short term accommodation for other uses (e.g. tourism) over this period.

Implications of the Project on short term accommodation availability is examined in the Social Impact Assessment (EMM, 2023a), highlighting that:

- Short term accommodation providers have reported high levels of demand and occupancy in the past year (commonly between 80% and 90% occupancy), which is largely attributable to construction workforces for the West Wyalong Solar Farm and Wyalong Solar Farm projects. Following expected completion of these in 2023, occupancy rates are expected to return to more normalised levels of around 60% to 70% on average.
- Once occupancy rates return to normalised levels, the construction workforce for the Project is not expected to result in demand and occupancy in the Catchment exceeding availability of short term accommodation supply and is thereby not expected to result in a material change in availability of accommodation for other purposes.

During operations, it is noted in the Social Impact Assessment (EMM, 2023a) that CGO may undergo periods of short term demand for accommodation during 'shut down' maintenance events that may result in overall demand for short term accommodation exceeding supply if not appropriately managed. However, this is expected to occur regardless of the Project and the Project will not exacerbate this issue, and the adverse impact can be managed with appropriate planning around shut-down timing to avoid peak demand periods for short term accommodation.

5.3 IMPACTS TO GOVERNMENT

5.3.1 Contribution to Australian and New South Wales Government Revenues

5.3.1.1 Approach

Estimates of taxation revenue to the NSW and Australian Government have been developed based on benchmarks of taxation revenue received compared to relevant NSW and Australian measures and applied to results from CGE modelling for NSW and Australia. The following benchmarks were applied by taxation item:

- Personal income tax (Australian Government): total income tax received (ABS, 2022d) compared to total wages and salaries paid to Australian employees (ABS, 2022e; ABS, 2022f) between the financial years of 2009/10 and 2020/21. This was applied to estimates of incomes paid in Australia from the modelling.
- Fringe benefits tax (Australian Government): total fringe benefits tax received (ABS, 2022d) compared to total wages and salaries paid to Australian employees (ABS, 2022e; ABS, 2022f) between the financial years of 2009/10 and 2020/21. This was applied to estimates of incomes paid in Australia from the modelling.
- Company income tax (Australian Government): total company tax received (ABS, 2022d) compared to total gross profit of businesses in Australia (i.e., total GDP less total wages and salaries paid to employees) (ABS, 2022e; ABS, 2022f; ABS, 2022g) between the financial years of 2009/10 and 2020/21. This was applied to estimates of GDP less incomes paid in Australia from the modelling.
- Goods and services tax (GST) (Australian Government): total GST received (ABS, 2022d) compared to total Australian GDP (ABS, 2022g) between the financial years of 2009/10 and 2020/21. This was applied to estimates of GDP for Australia from the modelling.
- Payroll tax (NSW Government): total payroll tax received (ABS, 2022d) compared to total wages and salaries paid to NSW employees (ABS, 2022e; ABS, 2022f) between the financial years of 2009/10 and 2020/21. This was applied to estimates of incomes paid in NSW from the modelling.

Both direct and flow-on impacts are included in the estimation of the above taxation revenues.

In addition to the above, the proponent will also pay the NSW Government royalties for the extraction of gold and silver. Royalty payments were estimated using royalty rates outlined by the NSW Government (NSW Government, 2023). The royalty rate for gold and silver is an ad valorem royalty with a base rate of 4% of 'ex-mine' value[6].

Government revenues were discounted to present value terms using a discount rate of 7%.

5.3.1.2 Tax Revenues

Estimates of the present value of anticipated taxation revenue (at a 7% discount rate) from both direct and flow-on activity associated with the Project are summarised in Table 5.7.

The NSW Government is expected to receive approximately $76.0 million in net additional revenue in present value terms, primarily through royalty payments, over the life of the Project. The Australian Government is estimated to receive approximately than $250.3 million in present value terms in various taxes.

It should be noted that a portion of Australian Government revenues are likely to provide benefits to NSW, with the State allocated a portion of GST revenue as well as through the subsequent expenditure and redistribution of Australian Government revenues to provide services and infrastructure throughout Australia (including NSW).

Table 5.7. Aggregate Government Revenues Supported by Project, Present Value (7% Discount Rate)

Tax	Estimated Present Value ($M)
NSW Government	
Payroll Tax	$19.7
Royalties	$56.3
Total	**$76.0**
Australian Government	
Personal Income Tax	$193.1
Fringe Benefits Tax	$4.8
Company Income Tax	$19.6
GST	$32.9
Total	**$250.3**

Note: Totals may not sum due to rounding.
Sources: ABS (2022d, 2022e, 2022f, 2022g), Prime Research (unpublished), Evolution Mining (unpublished), AEC.

5.3.2 Impact on Local Infrastructure and Service Provision

The Project will reflect an extension of existing mining activities and thereby retention of existing workforce and levels of activity in the Catchment economy. The Project is not expected to result in any tangible changes in demand and requirements for local infrastructure and service provision beyond what is currently available.

The proponent is already responsible for much of the road maintenance for the local roads in the immediate area surrounding CGO and between the mine and West Wyalong. These arrangements will continue with the Project. Evolution Mining has also historically contributed to various clubs and non-profits to support initiatives, projects and events that will provide positive outcomes to residents within the Bland, Lachlan and Forbes LGAs.

Additional details regarding potential impacts on local infrastructure and services from the Project are examined in the Social Impact Assessment (EMM, 2023a), highlighting that while the Project can be expected to contribute to an extension of CGO's existing impacts on local infrastructure and services, it is not expected to increase demand for local infrastructure and services.

In consideration of the above, it is anticipated that any Voluntary Planning Agreement would be based around continuing Evolution's existing levels of contributions and community support over the extended life of CGO.

[6] The ex-mine value refers to the value of the mineral once it is mined and brought to the surface. In some cases the costs associated with the processing or treatment may be allowable deductions. However, the costs associated with exploration, development and mining of the ore body and the rehabilitation of the site are not allowable deductions (NSW Government, 2023).

5.4 IMPACTS ON THE LOCAL PROPERTY MARKET

Construction of the Project is estimated to require an average of 71 FTE jobs in Year 1 and a peak workforce of approximately 108 workers (including direct construction workers as well as client/ project management workforce) and an average of 57 FTE jobs and a peak of 89 workers in Year 2 (see section 3.1.1.2). Of this construction workforce it is indicatively estimated approximately 70% may be sourced from outside the Catchment (see section 3.1.1.3) and require local accommodation.

Due to the relatively short term construction timeframe, it is anticipated that non-local members of the construction workforce would predominantly seek short term accommodation rather than rental accommodation. However, as has been the recent experience of the construction workforces associated with the two solar farms being constructed in the Catchment (the West Wyalong Solar Farm and the Wyalong Solar Farm), there is potential for Project construction to contribute to ongoing pressures on the rental market in the Catchment.

There has been some tightness in the property and rental markets and rising prices between 2020 and 2022 (see section 4), with limited availability of rental properties. As noted in the Social Impact Assessment (EMM, 2023a), the current tightness in the rental market locally can partially be attributed to the construction workforces for the two solar projects currently being constructed in the Catchment, with rental demand and prices increasing while these projects have been under construction. Construction of both projects were expected to be completed by late 2022 but did not meet these timeframes and are now expected to be completed during 2023 (see the Major Projects section in Appendix A).

Furthermore, property sales prices in the Catchment remain well below the NSW average and have begun to fall through the tail end of 2022 and early 2023 in response to increasing interest rates and global economic uncertainty. Most analysts are predicting property prices to continue to fall through 2023. While rental demand and prices remain high in the Catchment relative to historic levels, once the two solar projects are completed it can be expected that some of the current tightness and rising prices in the rental market will be alleviated.

The construction workforce can be expected to contribute to some pressures on the rental market in the Catchment, however, given the relatively modest non-local workforce anticipated to be required and expected completion of the two solar projects in 2023, the impacts of the non-local construction workforce on property and rental prices may reasonably be expected to be less than has been realised in recent years during construction of the two solar projects which had an estimated combined construction workforce of 450 people (Urbis, 2019; NSW Government, 2019).

Additional details of impacts on the property market during construction is presented in the Social Impact Assessment (EMM, 2023a).

Local property markets are not anticipated to be materially impacted by Project operations beyond existing levels. A key outcome of the Project will be the retention of the existing CGO workforce rather than generation of additional longer term jobs. Operations workers are expected to be accommodated as per existing accommodation arrangements. As the Project is not expected to result in any material change in existing operations workforce or accommodation arrangements, the local property market is not anticipated to be impacted by operations of the Project (noting though that this may extend any existing issues in terms of housing availability and affordability). This is examined in more detail in the Social Impact Assessment (EMM, 2023a).

The impact on the local property market from operations also has the potential to provide some positive impacts by supporting ongoing property demand in the local area through retention of an existing local workforce. Most analysts are predicting property prices to fall through 2023. As property sales demand and prices fall, and construction of the Project and the solar projects are completed, it can be expected that rental prices will follow suit. Without the Project it is likely many of the workers that live locally could leave to seek employment elsewhere which in a property market downturn could lead to high levels of vacancy rates and further declines in local property values, adversely impacting property owners.

5.5 CUMULATIVE ECONOMIC IMPACTS

An assessment of the Project's potential to generate cumulative social impacts was undertaken as part of the Social Impact Assessment (EMM, 2023a). The cumulative impact assessment included consideration of the following projects, additional details of which can be found in the Major Projects section of Appendix A:

- West Wyalong Solar Farm.
- Wyalong Solar Farm.
- Moomba to Wilton Pipeline Compressor Station.
- Moomba to Wilton Pipeline Accommodation Camp 6.
- Daroobalgie Solar Farm.
- Peninsula Solar Farm.

The Newell Highway Upgrade between West Wyalong, Forbes and Condobolin was not included in the assessment, as it was determined to be unlikely to coincide with the construction phase of the Project.

The cumulative impacts identified and examined in the Social Impact Assessment are aligned with the types of impacts relevant for the economic study and include the following impacts.

Impacts on Labour Market

Cumulative labour demand and increased competition for labour resources, which has the potential to reduce the availability of labour for local businesses, drive-up labour costs for businesses, increase reliance on non-local labour forces to support delivery of projects and, potentially, delay projects. As outlined in the Social Impact Assessment (EMM, 2023a), the construction industry nationally and in NSW is currently experiencing severe labour and skills shortages, in part due to difficulties in accessing skilled migrant labour due to restrictions and border closures imposed during the COVID pandemic.

The cumulative impacts of the Project in conjunction with other planned projects has the potential to exacerbate the impacts on the real wage rate outlined in section 5.1.4 and to increase the potential drawdown on other businesses and industries outlined in section 5.2.2.1.

However, it should also be recognised that as restrictions on migration and accessing overseas labour have and continue to ease post COVID lockdowns and reopening of borders, it can be expected that some of the issues currently being experienced in terms of labour shortages may also ease.

Impacts on Housing Affordability

Non-local workforces across multiple projects being developed concurrently can lead to increased demand for both short term accommodation and housing within the local rental/ property market and thereby lead to market tightness and increased prices for accommodation and housing. This impact has most recently been experienced in the Catchment during the development of the West Wyalong Solar Farm and the Wyalong Solar Farm, which has seen rental vacancy rates plummet and rental prices increase considerably, as outlined in sections 4 and 5.4.

An influx of non-local workers to develop multiple projects concurrently has the potential to exacerbate the impacts on short term accommodation availability outlined in section 5.2.2.3 as well as the availability of rental properties outlined in section 5.4. However, it should be noted that the Project's contribution to short term accommodation and rental property demand is expected to be relatively small and limited to construction (compared to existing demands placed on these markets by CGO), and current rental market tightness is expected to ease in the near term as current solar farm projects are completed. Due to the relatively short-term construction timeframe, it is anticipated that non-local members of the construction workforce would predominantly seek short-term accommodation rather than rental accommodation.

Impacts on Infrastructure and Service Provision

An influx of workers and population can increase pressures on a range of services and infrastructure and thereby require additional investment and funding. As outlined in the Social Impact Assessment, the cumulative impacts of multiple projects being developed concurrently with the Project has the potential to exacerbate accessibility of services and infrastructure, most notably health services which are identified as already experiencing limited availability locally (EMM, 2023a). In particular, service provision in the township of West Wyalong may come under increased strain as the closest township to the Project and also a key service hub for the Wyalong Solar Farm, West Wyalong Solar Farm and Moomba to Wilton Pipeline.

However, it should also be recognised that the Project's construction workforce is relatively small and the Project's ongoing impacts once operational will place no additional demand on local services than already occurs from CGO's existing activities.

6. MITIGATION AND ENHANCEMENT STRATEGIES

Assessment of the economic impacts of the Project above identified the Project will extend mining activities at CGO. This will provide an important retention of economic activity and employment within the Catchment and NSW economies that would otherwise be lost without the Project. Economic impacts of the Project are anticipated to be overwhelmingly positive, with minimal adverse economic impacts.

While the potential adverse economic impacts from the Project are assessed to be low, there are some potential areas that should be monitored, and strategies employed to ensure benefits of the Project to the Catchment and NSW are maximised and any potential adverse impacts minimised:

- To maximise local benefits derived from the Project, and consistent with existing policies implemented at CGO, the proponent and contractors engaged by the proponent will be encouraged to source labour locally where possible and practical and provide training opportunities where practical.
- The proponent has long standing relationships with local business and an established supply chain for its existing activities in the Catchment and NSW. To maximise local benefits derived from the Project, the proponent will continue to support local business by utilising these established supply networks and providing sufficient opportunities and information for local business to secure new supply contracts.

The above measures/ strategies are consistent with industry best practice and considered sufficient to address the adverse economic impacts identified in consideration of the relatively low level of magnitude of these impacts. It is not anticipated that any contingency plans will be necessary to manage residual risks.

It should be recognised that these strategies form part of the proponent's Project planning and modelling/ analysis of impacts in this report has been based on these strategies being implemented.

In addition to the above:

- The Project may result in some impacts in terms of additional demand for short term accommodation/ housing in the local area during the construction phase, which could impact on short term accommodation. This impact and proposed mitigations are examined in the Social Impact Assessment (EMM, 2023a), with the mitigation approach primarily focused prioritising local employment of construction workforce, continued engagement with key stakeholders and procurement initiatives that prioritise and incentivise the use of short term accommodation.
- the Agricultural Impact Statement (Minesoils, 2023) outlines that the proponent will continue to employ existing mitigation measures and strategies at CGO to ensure the long term impacts of the Project on agriculture are restricted to the additional disturbance area and minimise impacts on agriculture outside of the identified Project area.

7. COST BENEFIT ANALYSIS

7.1 METHOD AND APPROACH

The CBA assesses the impact of the Project scenario outlined in section 3.1 compared to a scenario without the Project, to understand the net benefit of the Project to NSW. The methodology used in conducting the CBA is outlined in Appendix C. Other key considerations for the CBA are outlined in the sections below.

7.1.1 Modelling Timeframes

The CBA examines the impacts of the Project over Project's 19-year timeframe, incorporating the construction period, the operational life of the Project, as well as decommissioning/ rehabilitation activities. For the purposes of the CBA and discounting, Year 1 of the Project has been assumed to correlate with 2024/25, however, it is stressed that this timing is used for demonstration purposes only and actual Project timing may differ.

Modelling has been undertaken starting from the financial year ending June 2023, with all dollar values presented in 2022 Australian dollar terms and discounted to 2022/23 present value terms.

7.1.2 Discount Rates

A base discount rate of 7% has been used for demonstration purposes (in line with State and national standards for real discount rates used in economic appraisal of projects), with additional discount rates also examined (4% and 10%). As all values used in the CBA are in real terms, the discount rate does not incorporate inflation (i.e., it is a real discount rate, as opposed to a nominal discount rate).

7.1.3 Scenarios Examined

The CBA examines the net (or incremental) impacts (benefits and costs) of the Project (the 'Project Case' scenario) compared to a 'Base Case' scenario of what would be expected to occur without the Project. Note that the assessment has examined the net change between the Project Case and Base Case, rather than separate analyses of the two scenarios.

For the purposes of this CBA, the Project Case and Base Case are defined as follows.

Project Case

The Project Case scenario is as per the information presented in section 3.1, noting that for the purposes of the CBA Year 1 is assumed to correlate with the 2024/25 financial year as outlined in section 7.1.1. Under this scenario the existing approved open pit operations and approved underground activities at CGO are also assumed to proceed through to depletion of economic resources, with production from the Project supplementing these deposits and extending overall CGO operations.

Base Case

The Base Case scenario assumes the Project is not developed. Under this scenario the existing approved open pit operations and approved underground activities at CGO are assumed to proceed through to depletion of economic resources, but production from the Project does not occur to supplement these deposits and extend overall CGO operations.

It is noted that where the Project does not proceed it is likely that production levels from the existing approved deposits would be expected to differ from what would occur with the Project (as production would not be able to be supplemented by gold/ silver ore from the Project and would thereby likely be brought forward). However, for simplicity it has been assumed production levels from the existing approved deposits does not differ between scenarios.

7.2 COSTS AND BENEFITS EXAMINED

7.2.1 Costs

7.2.1.1 Construction Costs

Initial construction expenditure and timing is as per that outlined in section 3.1.1.1.

7.2.1.2 Lifecycle/ Sustaining Capital Costs

Lifecycle/ sustaining capital expenditure and timing is as per that outlined in section 3.1.2.1.

7.2.1.3 Operating Costs

Operating costs and timing is as per that outlined in section 3.1.3.3.

7.2.1.4 Decommissioning/ Rehabilitation Costs

Decommissioning/ rehabilitation costs and timing is as per that outlined in section 3.1.4.

7.2.1.5 Biodiversity Offset Costs

The biodiversity offset costs and timing is as per that outlined in section 3.1.1.1.

7.2.1.6 Impacts to Agriculture

Impacts to agriculture are estimated to be as per those outlined in section 5.2.2.2. In including this impact:

- Both the loss of productivity from disturbance of land currently used for agriculture (244.4 ha, reflecting the maximum actual lost productivity), and the land capable of use for agriculture (785.6 ha, reflecting an opportunity cost to agricultural production), was included.
- The higher value of $412.04 per ha was used.
- Land disturbed by the Project was assumed to be removed from production as of Year 1.
- For the 244.4 ha returned to agriculture post completion of the Project, a linear ramp up period of five years to full production was assumed between Year 20 and Year 24.

7.2.1.7 Greenhouse Gas Emissions

Estimates of total greenhouse gas emissions generated by the Project are outlined in the Air Quality and Greenhouse Gas Assessment (EMM, 2023b). Including scope 1 emissions (direct associated with fuel combustion (diesel) by onsite plant and equipment as well as use of explosives) and scope 2 emissions (indirect associated with consumption of purchased electricity), the Project is estimated to produce a total of 4.25 Mt CO_2-e over the life of the Project. The timing of greenhouse gas emissions is as per the timing outlined in the Air Quality and Greenhouse Gas Assessment (EMM, 2023b).

In valuing the cost of emissions, the spot price for Australian Carbon Credit Units (ACCUs) was used, from the Clean Energy Regulator (2022). The spot price of ACCUs fluctuated between around $20 per t CO_2-e and $55 per t CO_2-e between July 2021 and September 2022, and for this study a value of $37.50 per t CO_2-e has been assumed. This price was applied to annual t CO_2-e produced by the Project to provide the total value of additional GHG emissions resulting from the Project each year.

7.2.1.8 Costs of Increased Travel

The Project will generate additional transport movements than would otherwise occur without the Project for the movement of labour to the mine site, as well as transport associated general freight, movement of fuel and supplies. This will result in increased vehicle fuel and maintenance costs, road damage costs as well as increase the risk of accidents due to increased travel.

Estimates of vehicle movements generated by the Project during construction were developed by EMM (2023c) and are summarised in the table below for construction peak, including an outline of traffic distribution in terms of where traffic is expected to originate from. Note that the table presents round trip vehicle movements, i.e. journeys to and from the mine site are counted as one vehicle movement. Assumptions used in developing these traffic estimates are presented in the Transport Impact Assessment (EMM, 2023c).

Table 7.1. Traffic Generation During Peak Construction, Vehicle Movements per Day to / from the Mine Site

Phase	Total (No.)	Wyalong / West Wyalong (%)	Forbes Shire (%)	Lachlan Shire (%)
Heavy Vehicles	12	80%	10%	10%
Workforce – Coach/ Minivan	5	80%	10%	10%
Workforce – Light Vehicles	15	80%	10%	10%
Construction Total	**32**	**80%**	**10%**	**10%**

Source: EMM (2023c)

Estimates of traffic generated during operations are not outlined in the Transport Impact Assessment (EMM, 2023c) on the basis that operations is anticipated to support the continuation of operational activity and jobs at CGO (and thereby traffic volumes) rather than increase activity. However, for the purposes of the CBA an estimate of daily traffic related to the Project specifically has been developed to provide indicative costs from travel associated with the Project. In developing these estimates the following approach was applied:

- Estimated traffic movements per employee by vehicle type (heavy vehicles, buses and light vehicles) were developed based on peak operational round trip movements per day (5 heavy vehicle movements, 8 coach/ minivan movements and 42 light vehicle movements) and peak operations jobs (256) from the Cowal Gold Operations Underground Development Project Traffic Impact Assessment (EMM, 2020).
- The above estimates of traffic movement per employee were applied to the peak year of operational employment outlined in Figure 3.3 (in section 3.1.3.4) to provide an indicative estimate of peak traffic movements associated with the Project.
- An indicative traffic distribution in terms of where traffic is expected to originate from was based on estimates of operational traffic movements from the Cowal Gold Operations Underground Development Project Traffic Impact Assessment (EMM, 2020).

The table below provides a summary of indicative round trip vehicle movements per day during peak operations of the Project based on the above approach.

Table 7.2. Traffic Generation During Peak Operations, Vehicle Movements per Day to / from the Mine Site

Phase	Total (No.)	Wyalong / West Wyalong (%)	Forbes Shire (%)	Lachlan Shire (%)
Heavy Vehicles	6	80%	10%	10%
Workforce – Coach/ Minivan	10	50%	25%	25%
Workforce – Light Vehicles	54	70%	15%	15%
Operations Total	**70**	**68%**	**16%**	**16%**

Source: EMM (2023c)

The vehicle movements outlined above represent the peak daily traffic during construction and operations. In developing annual estimates of vehicle movements the following was undertaken:

- For construction, the peak monthly FTE estimate was assumed to correspond with the peak construction vehicle movements. The number of vehicle movements for other months during construction were estimated based on the difference in FTEs from the peak month, based on the construction workforce histogram outlined in Figure 3.1 (in section 3.1.1.2).

- For operations, the peak year of operations labour outlined above is assumed to correspond to Year 5. The number of vehicle movements for other years during operations were estimated based on the difference in FTEs from Year 5 outlined in Figure 3.3 (in section 3.1.3.4).

Daily vehicle movements were converted to annual estimates assuming the mine operates for 365 days a year. Estimates of the total vehicle kilometres travelled each year were developed based on the following average distances:

- Approximately 45 km each way for travel between Wyalong / West Wyalong and the mine site.
- Approximately 100 km each way for travel between Forbes Shire and the mine site.
- Approximately 90 km each way for travel between Lachlan Shire and the mine site.

It should be noted that non-local workers (i.e. those residing outside the Catchment) staying in Wyalong/ West Wyalong while on rotation are also expected to travel to/ from their place of residence to the accommodation village at the start/ end of their rotation. For this assessment it has been assumed that all non-local labour would fly to/ from West Wyalong airport, with the majority travelling between Sydney and West Wyalong. In consideration of the number of non-local workers for construction and operations each year, an assumed approximately weekly shift rotation, and an aircraft capacity of no more than 50 people per flight, a peak of approximately 10 flights per week (each way) have been assumed (during Year 5 when operations labour associated with the Project peaks), and that these flights would not occur without the Project. Additional road travel associated with travel to/ from the airport is assumed to be negligible.

The cost of increased travel due to the Project has been measured through:

- Additional fuel and vehicle maintenance costs.
- Additional road damage costs.
- Road safety costs due to increased travel.

Air travel safety impacts have not been quantified and valued in consideration of the relatively low number of trips and low crash risk rate, making this impact negligible. Similarly, the marginal additional impacts to air transport infrastructure as a result of the additional flights is expected to be negligible and has not been quantified or valued in the CBA.

These costs are examined below.

Additional Fuel and Vehicle Maintenance Costs

Estimated fuel costs for road traffic were based on an average price in West Wyalong for diesel (used for heavy vehicles and buses) of approximately 198.90c/L and average price for unleaded petrol (used for light vehicles) of approximately 182.90c/L (PetrolSpy, 2023). These prices reflect the average cost for fuel in Wyalong as of March 22nd 2023. GST of 10% and fuel excise rate of 47.70c/L (ATO, 2023) were subtracted from these prices to provide the resource cost for diesel and unleaded petrol. Average kilometres travelled per litre of diesel were estimated at 0.36 for heavy vehicles and 0.30 for buses, with 0.11 kilometres per litre of unleaded for light vehicles (ABS, 2020).

Estimates of aircraft fuel costs were estimated based on the following:

- An average of approximately 3.125 litres of fuel consumed per 100 passenger tonne-kilometres (pax-km) for transpacific aircraft travel (ICCT, 2018), adjusted by 150% to account for regional travel.
- An average of 10.9 pax-km per aircraft kilometre flown for domestic aircraft in Australia in 2022 (BITRE, 2023).
- An average flight distance of 370 km between Sydney and West Wyalong.
- An average jet fuel price in Australia of approximately $1.30/L in 2022 (Index Mundi, 2023).

Additional maintenance costs for road vehicles were estimated at 38.57 c/km for heavy vehicles, 16.00 c/km for buses and 10.01 c/km for light vehicles, based on data from ATAP (2016) and accounting for inflation between 2013 and December 2022 (ABS, 2023b). Estimates of maintenance for aircraft per flight was not available. As a

proxy the ratio between road vehicle maintenance to fuel costs was assumed to also apply for aircraft maintenance to aircraft fuel costs.

These rates were applied to the travel distances as estimated above.

Additional Road Damage Costs

Additional road damage costs were estimated at 25.55 c/km for heavy vehicles, 9.68 c/km for buses and 5.15 c/km for light vehicles, based on data from Transport for NSW (TfNSW, 2020) and accounting for inflation between June 2019 and December 2022 (ABS, 2023b).

These rates were applied to the travel distances as estimated above.

Road Safety Costs

The increase in travel may be expected to provide an increased risk of road crashes. The Transport Impact Assessment (EMM, 2023c) outlines the routes anticipated to be used, including whether the roads are sealed or unsealed and road widths. Data from ATAP (2016) provides average crash rates on non-urban roads per 100 million vehicle kilometres travelled for a range of road types and widths; based on the preferred routes, the following average estimated crash rates per 100 million vehicle kilometres travelled were used:

- To / from Wyalong / West Wyalong:
    - 0.6 crashes resulting in a fatality.
    - 20.19 crashes resulting in serious injury.
    - 24.75 crashes resulting in minor injuries/ property damage.
- To / from Forbes Shire:
    - 1.19 crashes resulting in a fatality.
    - 26.04 crashes resulting in serious injury.
    - 50.35 crashes resulting in minor injuries/ property damage.
- To / from Lachlan Shire:
    - 1.34 crashes resulting in a fatality.
    - 25.49 crashes resulting in serious injury.
    - 52.74 crashes resulting in minor injuries / property damage.

The following values per crash type were used, based on value estimates from ATAP (2016) inflated to December 2022 dollar terms (ABS, 2023b):

- Fatal crashes (including medical costs, insurance, workplace production losses, legal costs, vehicle and property repair costs, and other costs such as travel delays and emergency service provision): approximately $2.80 million per crash.
- Serious injury crashes: approximately $647,500 per crash.
- Minor injury / property damage crashes: approximately $24,200 per crash.

These crash rates and values per crash were applied to the travel distances as estimated above.

7.2.2 Benefits

7.2.2.1 Value of Gold and Silver Production

The value of gold and silver production has been estimated based on production rates of processed gold and silver provided by the proponent and summarised in section 3.1.3.1, combined with the assumed prices for gold and silver product outlined in section 3.1.3.2.

7.2.2.2 Benefits to Labour

While expenditure on employees represents a cost (and is included in the operating costs in section 3.1.3.3), employment also represents a social benefit to those employed through a number of avenues, including the provision of incomes (and thereby providing higher standards of living), a sense of identity, self-worth, and satisfaction. Employment has also been linked with a number of positive mental and physical health benefits.

Labour benefits are often excluded from CBA. The primary reason for this exclusion is due to the use of "shadow wages"[7] in estimating operating costs, or the use of a highly conservative assumption that the labour would otherwise be employed elsewhere with minimal difference in compensation. However, for simplicity and consistency with the modelling of Project impacts in section 5.1, this CBA has used a market wage in estimating operating costs and an assumption that labour would otherwise be employed elsewhere with minimal difference in compensation is considered inappropriate where labour would not otherwise be gainfully employed. The Project will deliver an important continuation of employment opportunities at CGO. It is therefore considered appropriate to consider the employment supported by the Project as a benefit to those employed.

Employment can be valued in terms of the wages and salaries labour receives less income tax and the opportunity cost to these individuals for their time. The opportunity cost is often valued based on the alternative income they would receive without the Project, either through alternative employment or through social security payments. For the purposes of this assessment it was assumed that 25% of the wages and salaries paid to operations staff represents a net benefit to these individuals compared to the base case.

7.2.3 Impacts That Have Not Been Quantified

7.2.3.1 Air Quality Impacts

The Air Quality Impact Assessment (EMM, 2023b) indicates that the predicted concentrations and deposition rates for incremental particulate matter are below the applicable impact assessment criteria at all assessment locations. Costs from air quality impacts of the Project are thereby anticipated to be negligible and have not been valued for inclusion in this assessment.

7.2.3.2 Noise Impacts

The Noise and Vibration Impact Assessment (EMM, 2023d) outlines that impacts from the Project, in conjunction with existing activities, will satisfy and be within approved existing noise limits during construction and operation for most locations assessed. It is noted that a noise agreement is already in place with one landholder where noise impacts are identified as exceeding approved noise limits, while other locations of exceedance are subject to mitigation upon request or acquisition upon request in accordance with the development consent.

Noise modelling results show that noise impacts at night are predicted to satisfy the relevant sleep disturbance screening criterion at all residential assessment locations.

Assessment of blasting noise impacts and traffic noise impacts related to the Project indicates that impacts from these activities are anticipated to be negligible (EMM, 2023d).

As noise impacts are assessed to be negligible this impact has not been valued for inclusion in the CBA.

7.2.3.3 Visual Amenity Impacts

The Visual Impact Assessment (EMM, 2023e) examined visual impacts of the Project from five representative viewpoints and 20 dwellings. The assessment outlines that no viewpoints or residences will record visual impacts of high impact rating, while only one viewpoint/ residence will record a visual impact rating above a low rating. With appropriate mitigation (tree planting to screen views upon request), the visual impacts of the Project are expected to be low.

[7] The shadow wage refers to the opportunity cost of labour. Where a shadow wage (rather than market wage) is used in estimating operating costs, the labour benefit is inherently captured in the CBA and should not be measured separately.

Lighting during construction and operations also has the potential to result in visual impacts to nearby properties, however, lights will be inwardly focused and shielded to minimise light spill to neighbouring properties or the night sky.

As visual impacts are assessed to be of low impact with appropriate mitigation, this impact has not been valued for inclusion in the CBA.

7.2.3.4 Groundwater Impacts

The Groundwater Impact Assessment (EMM, 2023f) identified that the difference in drawdown impacts between the approved CGO operations and the additional proposed mining activities are considered minor. The continued operation of the CGO borefields in association with the Project is not predicted to result in groundwater level drawdown changes greater than 2 metres from CGO's current approved operations. Consistent with the existing development consents, CGO will provide a compensatory water supply to any landowner of privately-owned land whose rightful water supply is adversely and directly impacted (in accordance with the Aquifer Interference Policy DPI 2012 criteria) as a result of the Cowal Gold Operations.

If required, compensatory water supply measures will be developed in consultation with DPE Water and DPE and will provide an alternative long-term supply of water that is equivalent, in quality and volume, to the loss attributable to the CGO. Costs for this (in the event required) have not been included in the CBA but are expected to be negligible relative to the overall costs and benefits included in the CBA.

Other impacts on groundwater were assessed as being of moderate or lower consequence and were not valued for inclusion in the CBA on this basis.

7.2.3.5 Surface Water Impacts

Potential impacts of the Project on surface water are examined within the Surface Water Assessment (ATC Williams, 2023), which identified:

- Water demand associated with the Project is anticipated to be met through the currently approved water supply sources and infrastructure.
- There are unlikely to be increased impacts on Lachlan River flows as a result of the Project due to a predicted decrease or only a slight increase in the forecast demand on licensed extraction, while the reliance on external borefield sources is forecast to decrease as a result of the Project.
- No offsite spills are forecast from contained water storages.
- Placement of inert waste rock directly into Lake Cowal during construction of the LPB has the potential to affect the water quality of Lake Cowal. The risk to lake water quality would be mitigated by stockpiling the waste rock material to be used within the CGO existing disturbance area and undertaking a geochemical testing program to confirm that the material is inert (i.e. non-acid forming, not sodic/ dispersive or saline and contains relatively low soluble environmentally significant constituents). The silt curtain will trap fine sediment and control the migration of suspended material into the lake to manage turbidity impacts. A procedure will be developed to test water quality before and during pumped return of the captured water to Lake Cowal.
- The extension of the LPB is expected to result in a minor reduction in storage capacity of Lake Cowal, and thereby an increase in predicted peak flood levels for Lake Cowal, with an average change of 13 millimetres at a 1% Annual Exceedance Probability (AEP). The Project is predicted to have negligible effects on the long-term water balance of Lake Cowal and on peak flood levels.

Overall, impacts of the Project to surface water sources and available supply is expected to be small and has not been valued for inclusion in the CBA on this basis.

7.2.3.6 Ecological Impacts (e.g. Flora / Fauna)

Potential ecological and biodiversity impacts, and approach to mitigating or avoiding these impacts, have been valued as part of the biodiversity offset (see section 7.2.1.5) and have thereby not been included as a separate cost in the CBA to avoid double counting.

Details on impacts covered within the biodiversity offset are provided within the Biodiversity Development Assessment Report (EMM, 2023g).

7.2.3.7 Aboriginal Heritage

The Aboriginal Cultural Heritage Assessment (EMM, 2023h) outlines that six specific locations were identified in the general region as having traditional, historical and/ or contemporary values to the local Aboriginal community. While none of these sites are within the Project area, they are in the general proximity of Lake Cowal.

Archaeological field surveying and test excavations identified some 28 sites with Aboriginal artefacts, of which 19 would be subject to direct Project impacts resulting in their either partial or complete loss. However, many of these sites only have a tentative classification at this stage. In addition, the Project would directly impact approximately 34 ha where such cultural material is more likely to be present based on predictive models. A low-density stone artefact background scatter is considered present across the entire additional disturbance area and would also be adversely affected. While the Project would result in intergenerational/cumulative loss to material culture, the Aboriginal Cultural Heritage Assessment (EMM, 2023h) concludes that there would be numerous cultural heritage benefits. These include additional on-Country opportunities for the local Aboriginal community through archaeological mitigation, a greater understanding of the past and contemporary values in the region, and opportunities for heritage interpretation and public outreach.

The Aboriginal Cultural Heritage Assessment (EMM, 2023h) recommends an Aboriginal Cultural Heritage Management Plan and a heritage-interpretation strategy be developed to provide the post approval framework for managing impacts in the Project area and understand interpretive values and opportunities. As these studies are recommended to be conducted post approval, a valuation for the potential impacts of the Project on Aboriginal cultural heritage was not able to be included in the CBA.

7.3 CBA RESULTS

The table below outlines the present value (PV) of the identified costs and benefits associated with the Project, between the financial year ended June 2025 and financial year ended June 2124, at discount rates of 4%, 7% and 10%.

The CBA modelling for the project at the discount rate of 7% is economically desirable, with the following results:

- A Net Present Value (NPV) of $313.8 million over the assessment period with total present value (PV) benefits of approximately $1,926.6 million compared to an aggregated PV costs of approximately $1,612.8 million.
- A BCR of 1.19, highlighting that the Project is estimated to return $1.19 for every dollar cost.

The CBA identifies that at a 7% discount rate the Project is economically desirable with the benefits outweighing the costs. The Project returns a desirable result across each of the discount rates examined, with the BCR ranging between 1.16 (10% discount rate) and 1.23 (4% discount rate). The CBA is insensitive to the discount rate used with minimal change in BCR across discount rates examined. The Project has an Internal Rate of Return (IRR) of 22.7%.

Table 7.3. Summary CBA Results of Project Impacts to NSW

Impact	PV ($M) – 4% Discount Rate	PV ($M) – 7% Discount Rate	PV ($M) – 10% Discount Rate
Costs			
Construction Costs	$83.1	$77.1	$71.7
Lifecycle/ Sustaining Capital Costs	$224.5	$190.8	$164.3
Operating Costs	$1,548.5	$1,199.8	$946.3
Decommissioning/ Rehabilitation Costs	$5.4	$3.1	$1.8
Biodiversity Offset Costs	$35.3	$31.7	$28.6
Impacts to Agriculture	$9.0	$5.3	$3.7
Greenhouse Gas Emissions	$111.9	$88.4	$71.4
Costs of Increased Travel	$20.9	$16.6	$13.4
Total Costs	***$2,038.7***	***$1,612.8***	***$1,301.2***
Benefits			
Value of Gold and Silver Production	$2,443.2	$1,875.2	$1,464.2
Benefits to Labour	$65.2	$51.5	$41.3
Total Benefits	***$2,508.4***	***$1,926.6***	***$1,505.5***
Summary			
Net Present Value (NPV)	**$469.7**	**$313.8**	**$204.3**
Benefit Cost Ratio (BCR)	**1.23**	**1.19**	**1.16**

Source: AEC.

7.4 SENSITIVITY ANALYSIS

The sensitivity analysis has been undertaken using a Monte Carlo analysis (refer to Appendix C) across the key assumptions used in the CBA modelling (the base assumptions used are outlined in section 7.2).

Each of the assumptions has been tested in isolation with all other inputs held constant, with the results reported in Table 7.4 in terms of the modelled change in NPV resulting from the variance in the base assumptions at a discount rate of 7%. The final row of the table examines each assumption simultaneously to provide a "combined" or overall sensitivity of the model findings to the assumptions used. The table also outlines the distribution used allowing for a 10% confidence interval, with the "5%" and "95%" representing a 90% probability that the distribution and NPV will be within the range outlined in the table.

The table shows that, at a discount rate of 7%, there is a 90% probability the Project will provide an NPV between -$64.9 million and $682.4 million. Sensitivity testing returned a positive NPV across 91.4% of the 5,000 iterations run in Monte Carlo analysis, with the analysis most sensitive to the net operating result (i.e., difference between value of gold and silver production and operating costs in the table below); the larger the net operating result the larger the NPV. Given and silver gold prices used in the analysis are considerably below current prices the sensitivity analysis is considered likely to overstate the probability of returning a negative NPV.

Table 7.4. Sensitivity Analysis Summary, Discount Rate 7%

Variable	NPV ($M)	
	5%	95%
Costs		
Construction Costs	$296.7	$325.5
Lifecycle/ Sustaining Capital Costs	$282.1	$345.7
Operating Costs	$90.1	$534.5
Decommissioning/ Rehabilitation Costs	$291.1	$329.8
Biodiversity Offset Costs	$291.9	$335.0
Impacts to Agriculture	$296.5	$318.5
Greenhouse Gas Emissions	$293.1	$349.2
Costs of Increased Travel	$292.6	$330.4
Benefits		
Value of Gold and Silver Production	-$32.1	$641.3
Benefits to Labour	$298.7	$328.8
Combined	**-$64.9**	**$682.4**

Notes: The percent distributions used for each variable are provided below:
- Construction costs: maximum 30% higher, minimum 20% lower.
- Lifecycle/ sustaining capital costs: maximum 30% higher, minimum 20% lower.
- Operating costs: normally distributed with standard deviation of 0.1.
- Decommissioning/ rehabilitation costs: maximum 30% higher, minimum 20% lower.
- Biodiversity offset costs: normally distributed with standard deviation of 0.2.
- Cost of greenhouse gas emissions: normally distributed with standard deviation of 0.2.
- Costs of increased travel: normally distributed with standard deviation of 0.2.
- Value of gold and silver product: normally distributed with standard deviation of 0.1.
- Benefits to labour: normally distributed with standard deviation of 0.1.

Source: AEC.

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APPENDIX A: SOCIO-ECONOMIC DATA

SUMMARY

Table A. 1. Summary Statistics

Indicator	Catchment	New South Wales
Population		
Population (2021)	21,074	8,093,815
Population Growth (Annual Average, 2001 to 2021)	-0.71%	1.08%
Population Growth (Annual Average, 2011 to 2021)	-0.56%	1.15%
Population Growth (Annual Average, 2019 to 2021)	-0.91%	0.37%
Projected Population (2041)	22,534	9,692,226
Projected Population Growth (Projected Annual Average, 2021 to 2041)	0.34%	0.91%
Average Age (Years, 2021)	41.74	39.70
Gross Regional Product		
Gross Regional Product ($M) (2020/21)	$1,462	$643,146
Gross Regional Product Growth (Annual Average, 2010/11 to 2020/21)	0.04%	2.09%
Gross Regional Product Growth (Annual Average, 2019/20 to 2020/21)	5.25%	1.44%
Industry Value Add		
Total IVA ($M) (2020/21)	$1,265	$530,839
Industry Value Add Growth (Annual Average, 2010/11 to 2020/21)	-0.07%	2.18%
Contribution of Mining to IVA (%, 2020/21)	11.24%	2.06%
Labour Force		
Labour Force (September 2022)	11,052	4,400,245
Labour Force Change (Sep 2012 to Sep 2022)	527	604,942
Labour Force Change (Sep 2017 to Sep 2021)	-234	314,389
Unemployment		
Unemployment Rate (Sep 2022)	2.42%	3.25%
Unemployment Rate Change (Sep 2012 to Sep 2022) (ppt)	-3.28	-2.06
Unemployment Rate Change (Sep 2017 to Sep2022) (ppt)	-1.66	-1.28
Property		
Median Property Price (2022) [(a)]	$251,667	$870,000
Median Property Price Growth (Average Annual, 2018 to 2022) [(a)]	6.91%	7.35%
Average Rent (2021)	$222	$449
Rent increase (Average Annual, 2016 to 2021)	6.98%	2.30%
Building Approvals		
Residential Approvals (Number, 2022) [(b)]	44	48,293
Residential Approvals (Value, 2022) [(b)]	$23,868	$23,485,575
Residential Approval Growth in Value (Average Annual 2017 to 2022) [(b)]	4.26%	-2.01%
Income Inequality		
Proportion of families in poverty (Weekly earnings >$400 a week, 2021)	2.29%	2.2%
Proportion of families in poverty (Weekly earnings >$400 a week, 2011)	5.62%	3.72%

Note:
(a) Property Values are taken from the March quarter.
(b) Calendar years, 2022 goes to November.
Sources: ABS (2022a), NSW DPE (2022), ABS (2022b), AEC (unpublished[a]), ABS (2023a), AEC (unpublished[b]), Dept. of Communities and Justice (2022), ABS (2022c).

MINING ACTIVITY

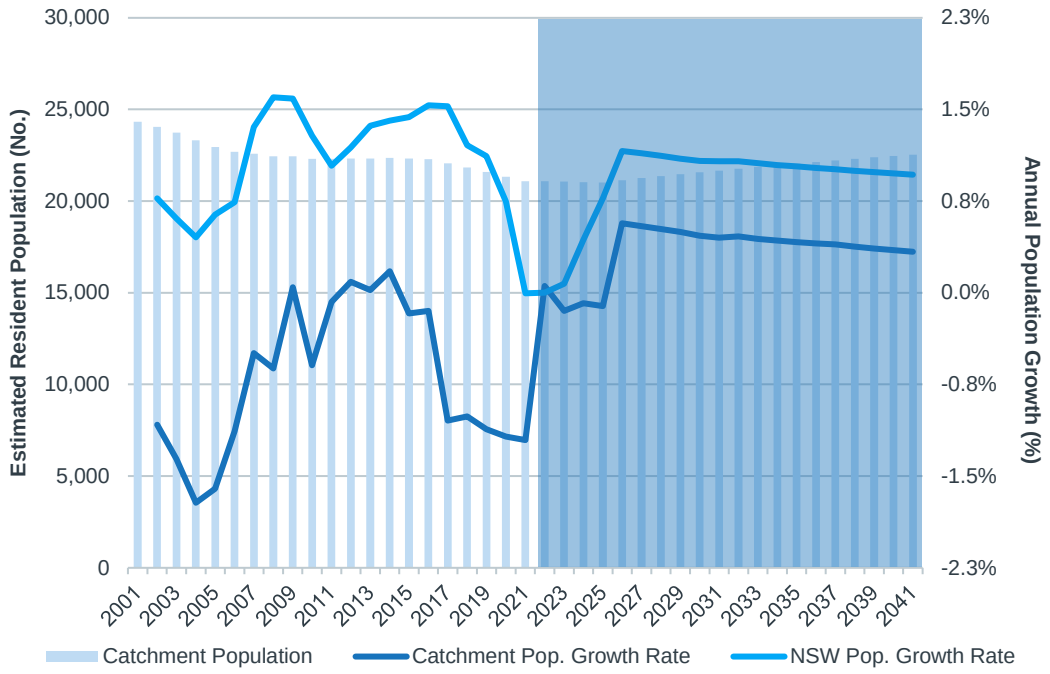
Table A. 2. The Impact of Mining on the Catchment

Year	Mining IVA ($M)	Mining Employment	Gold Price ($) (ABC Bullion) [(a)]	Gold Production (Ounces)
2006/07	$93.6	389	$766.0	-
2007/08	$110.7	494	$966.9	-
2008/09	$111.6	430	$1,155.9	-
2009/10	$114.9	534	$1,460.4	-
2010/11	$127.5	555	$1,407.4	-
2011/12	$147.2	514	$1,563.5	-
2012/13	$163.9	518	$1,352.3	-
2013/14	$166.8	469	$1,397.5	-
2014/15	$164.5	513	$1,533.2	-
2015/16	$172.5	560	$1,769.7	237,940
2016/17	$180.5	549	$1,620.2	263,015
2017/18	$168.5	494	$1,695.3	257,951
2018/19	$148.3	468	$2,015.0	-
2019/20	$151.4	496	$2,589.2	251,500
2020/21	$142.2	389	$2,342.8	210,847
Average	*$144.3*	*488*	*$1,575.7*	-

Notes: (a) Gold price at the end of financial year
Sources: AEC (unpublished[a]), AEC (unpublished[b]), ABC Bullion (2022), Investment NSW (no date), Mining Data Solutions (2023), AEC (2020), Ballard (2021).

POPULATION

Figure A. 1. Historical and Projected Population Growth, 2001 to 2041



Source: ABS (2022a), NSW DPE (2022).

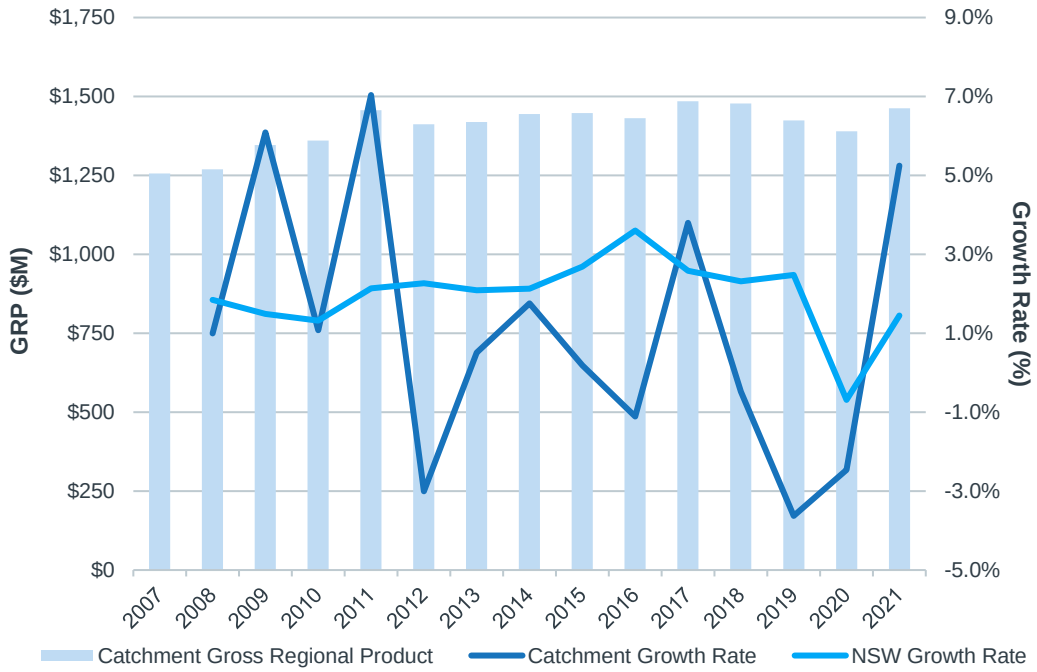
ECONOMY

Table A. 3. Journey to Work by Job Location, Catchment, 2021

Industry	Live and Work Local[(a)]	Imported Labour[(b)]	Total Workers (PoW)[(c)]	Exported Labour[(d)]
Agriculture, Forestry and Fishing	2,036	222	2,258	156
Mining	441	186	627	99
Manufacturing	349	29	378	23
Electricity, Gas, Water and Waste Services	74	21	95	5
Construction	526	49	575	84
Wholesale Trade	178	46	224	13
Retail Trade	736	59	796	22
Accommodation and Food Services	502	31	533	18
Transport, Postal and Warehousing	282	31	313	35
Information Media and Telecommunications	8	0	8	10
Financial and Insurance Services	65	3	69	4
Rental, Hiring and Real Estate Services	48	4	51	3
Professional, Scientific and Technical Services	210	33	244	21
Administrative and Support Services	148	9	157	22
Public Administration and Safety	441	41	483	53
Education and Training	951	114	1,029	74
Health Care and Social Assistance	921	129	1,050	104
Arts and Recreation Services	28	0	28	7
Other Services	357	29	386	23
Total	**8,265**	**1,037**	**9,302**	**775**

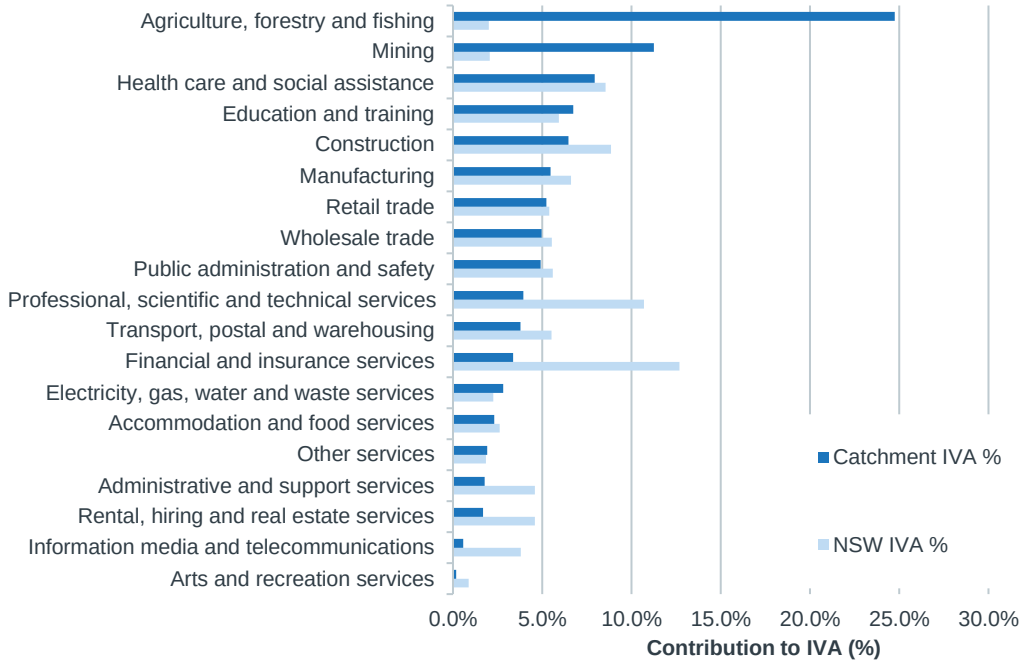
Notes: (a) The number of workers that both live and work in the catchment. (b) The number of workers that work in the catchment but live elsewhere (i.e., people that do not live in the catchment but commute to or temporarily stay in the catchment for work). (c) The combination of the first and second column, representing the total jobs located in the catchment (i.e. place of work employment data). (d) The number of workers that live in the catchment but work elsewhere (i.e. people that live in the catchment but commute from or temporarily stay outside the catchment for work). The combination of this column with the first column represents the total number of people residing in the catchment that have a job (i.e. place of usual residence employment data).
Source: ABS (2022b).

Figure A. 2. Gross Regional Product ($M), 2006/07 to 2020/21



Source: AEC (unpublished[a]).

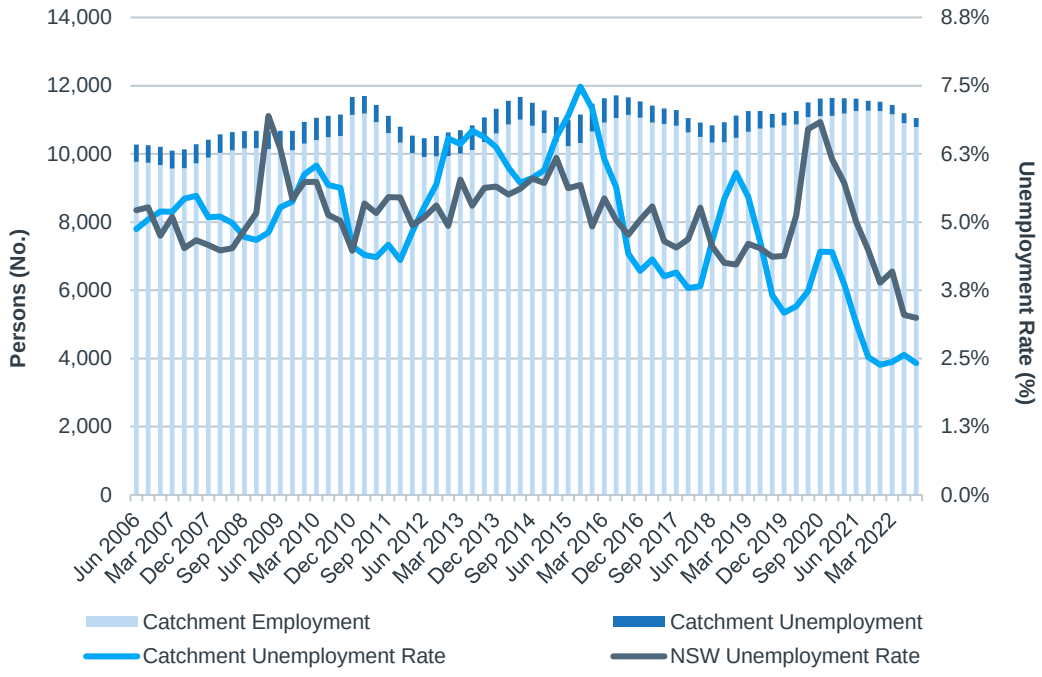
Figure A. 3. Industry Value Added by Industry, 2020-21



Source: AEC (unpublished[a]).

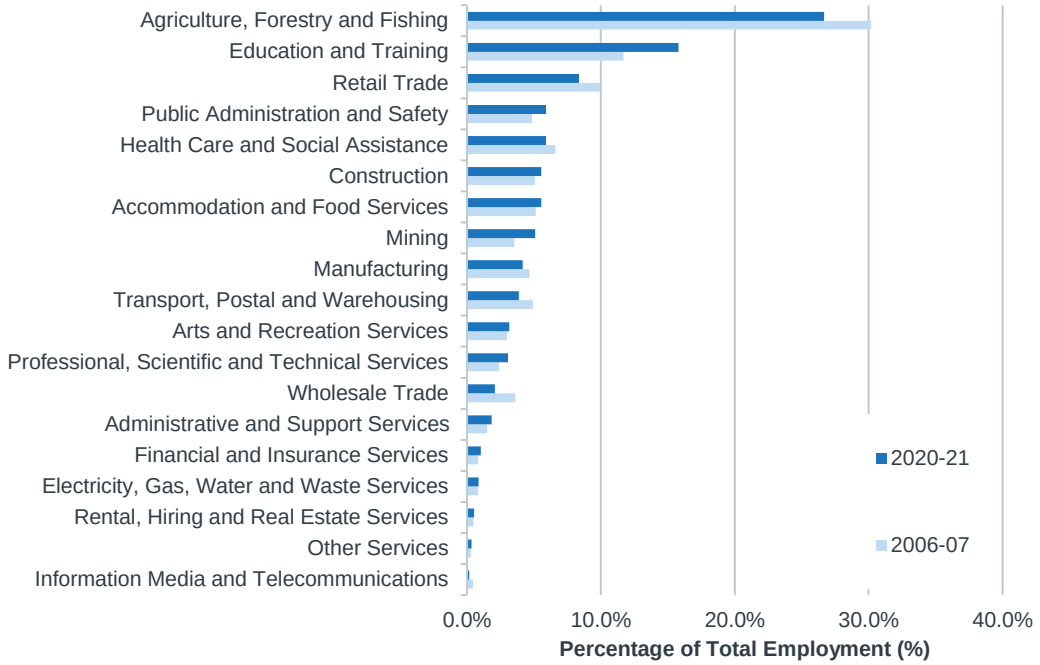
LABOUR MARKET

Figure A. 4. Unemployment and Labour Force, 2006 to 2022



Source: ABS (2023a), Jobs and Skills Australia (2023).

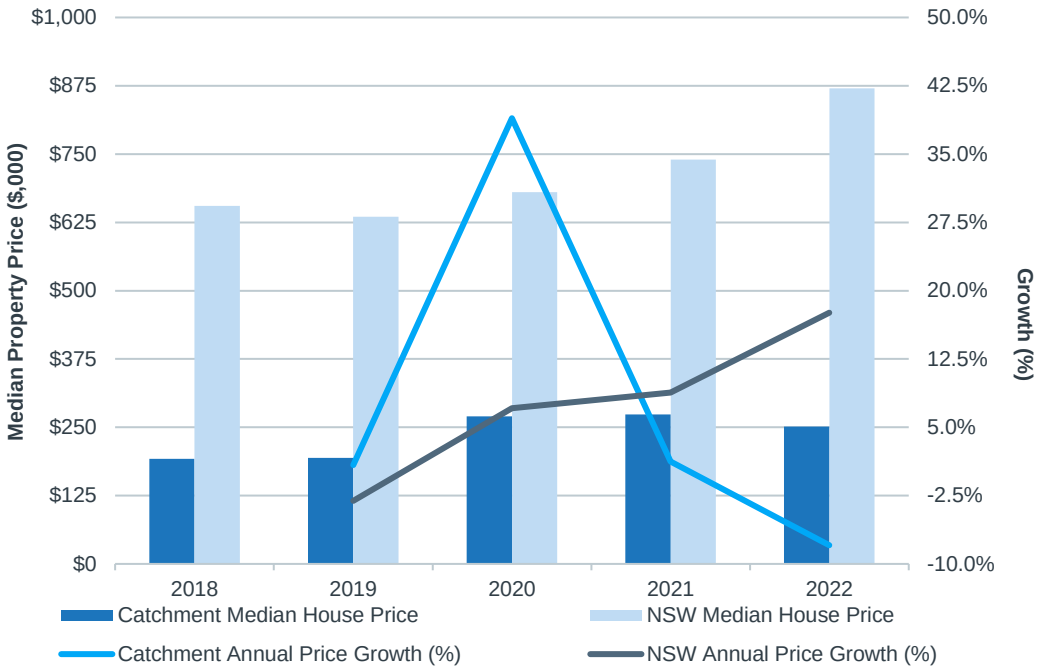
Figure A. 5. Employment by Industry in the Catchment, 2006-07 and 2020-21



Source: AEC (unpublished[b]).

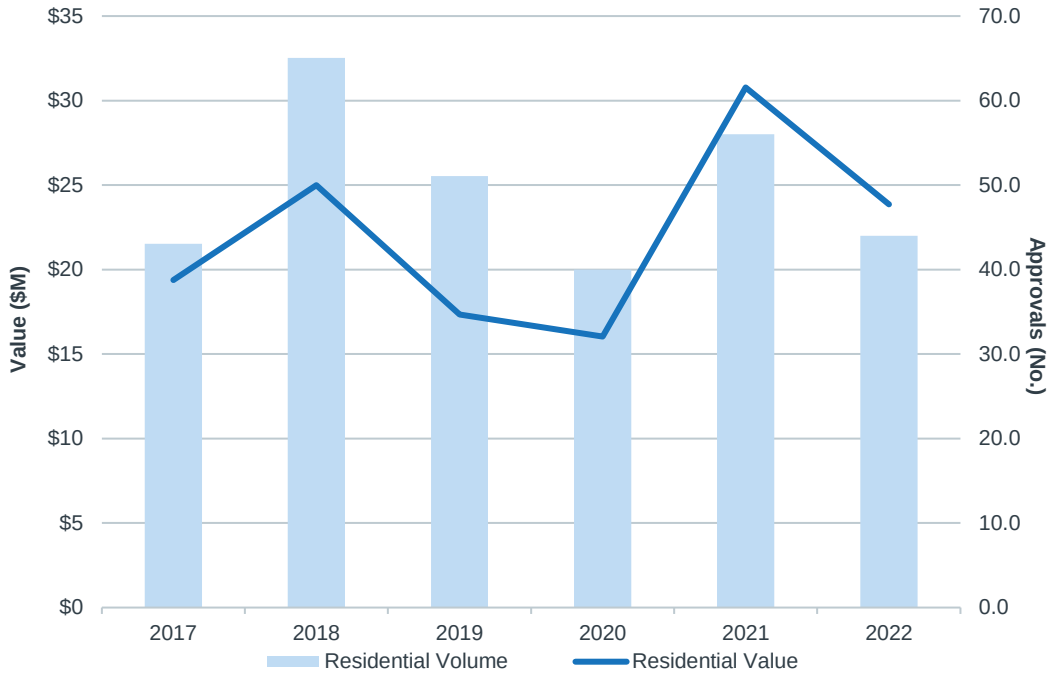
PROPERTY MARKET

Figure A. 6. Median Property Price, 2018 to 2022



Note: In 2020, less than 10 properties were sold in Lachlan and so this is not available or included in the total for the catchment.
Source: Dept of Communities and Justice (2022).

Figure A. 7. Building Approvals, Catchment, 2017 to 2022



Note: Calendar years, 2022 is up to and include November
Source: ABS (2022c).

MAJOR PROJECTS

Listed below are the major projects, currently in development or proposed to be developed, within the Catchment.

- **Temporary Accommodation Camps:** To maintain the Moomba to Wilton Pipeline, temporary accommodation camps need to be constructed and operated throughout NSW (APA, 2022). The sixth camp is to be built in 2025, north-east of West Wyalong in the Bland Shire Council LGA.
- **West Wyalong Solar Farm:** Large-scale (135 MW) solar farm, 17 km north-east of West Wyalong in the Bland Shire Council LGA. The value of the project is stated to be over $30 million (Urbis, 2018). The project was expected to be completed in late 2022 (lightsourcebp, 2021). This deadline was not met, as the project is still in construction (PCL, 2023).
- **Wyalong Solar Farm:** Large-scale (100 MW) solar farm, 7.5km north-east of West Wyalong in the Bland Shire Council LGA. The approximate value of the project is $130 million (AccentEnvironental, 2018). The project was expected to be finished towards the end of 2022 (WyalongSolarFarm, 2021). This deadline was not met, in part due to weather-related delays, with the site set to be operational in the second half of the 2023 financial year (Bloch, 2023).
- **Newell Highway Upgrades:** The longest highway in NSW is undergoing various upgrades, from flood mitigation works south of Forbes, to the expansion of lanes throughout. These works impact the both the Forbes and Bland LGAs. The complete Newell Highway upgrades are expected to cost $500 million (TransportNSW, 2023b), with the lane upgrades estimated at $75 million (Dept of Infrastructure, Transport, 2023), and $250 million going towards the flood mitigation works (TransportNSW, 2023a). The upgrades, particularly, lane upgrades, started in late 2020 and are expected to finish in late 2023 (Dept of Infrastructure, Transport, 2023). The flood mitigation work is still in development (TransportNSW, 2023a).
- **Daroobalgie Solar Farm:** Large-scale (100 MW) solar farm, 11 km northeast of Forbes in the Forbes Shire Council LGA (PacificHydro, 2022). The capital investment for the farm is stated to be $188 million, with an estimated construction timeline of between 12 and 18 months.
- **Peninsula Solar Farm:** Large-scale (80MW) solar farm, in Paytens Bridge 43km southeast of Forbes in the Forbes Shire Council LGA (Accent Environment, 2022). The forecasted cost is approximately $195 million, with construction expected to take 16 months once the project is approved.

APPENDIX B: CGE METHODOLOGY

MODEL OVERVIEW

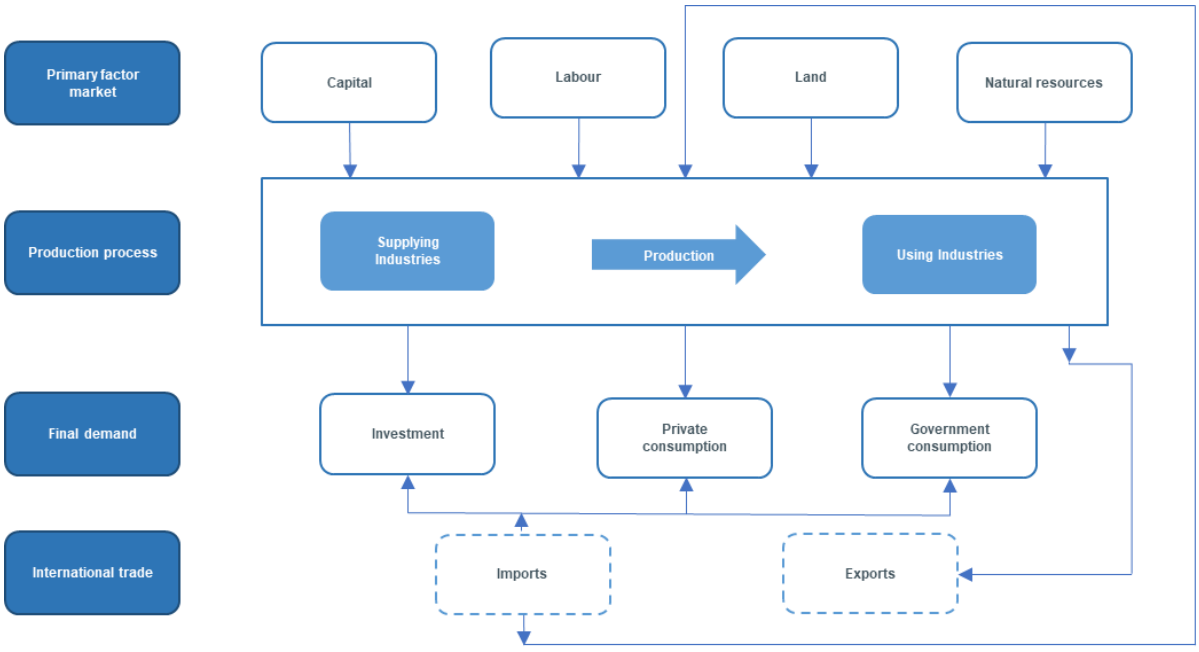
Computable General Equilibrium (CGE) economic models represent the workings of the economy through a system of interdependent behavioural and accounting equations linked to an input-output database.

Beginning with the production processes of individual industries, supported by inputs from other industries and the use of the primary factors of production, then adding in investment demand, private and government consumption, imports and exports, CGE modelling represents a fully integrated model of the world economy. In the model used for this assessment, production technology, individual markets, investment, trade and consumption are represented by equations with strong microeconomic foundations. The simultaneous solution of these equations in response to external changes (or 'shocks') generates the model solutions. When an economic shock, such as a new project, is applied to the model, each of the markets adjusts to a new equilibrium according to the economic theory and behavioural parameters that underpin the model.

In addition to recognising the linkages between industries in an economy, CGE models also recognise the constraints that apply in an economy (e.g. increased demand for labour will push the costs of labour up if there is full employment).

The CGE model used for this assessment is a dynamic model, which means it solves year-by-year, allowing a stream of annual results to be reported. Results are presented as deviations from a base (or reference) case, where the base case represents an anticipated growth path of the economy without the project.

Figure B.1. Representation of a Single Region in the CGE Model



MODELLING ASSUMPTIONS

The economic impacts of the three components of the Cowal Gold Operations Open Pit Expansion on the Catchment, NSW and national economies has been assessed by Prime Research utilising the Tasman Global Computable General Equilibrium (CGE) modelling framework.

Dynamic simulations using CGE modelling require two separate model runs. The first model run, known as the 'base case', simulates one view of the economic future. In this view of the future the Project does not proceed.

In the second model run, known as the 'with project case', an alternative view of the economic future is simulated. In this view of the future the Project development proceeds, and includes activities associated with mining activity for domestic and export markets.

Economic growth rates used in the modelling are based on near-term projections from Australian Government and State Treasuries, and medium to long term projections are a function of assumptions regarding changes in population, and particularly changes in the working age population), workforce participation rates and changes in labour productivity.

Regional population growth used in the modelling has been projected using an in-house demographic model. This model projects how populations change in each region and subsequently estimates changes in the working age population which flows through to regional labour supply and participation rates.

Population growth for the eight Australian States and Territories incorporates detailed ABS data on population levels, births, deaths and migration. Population growth in the regional catchment is based on information referenced from NSW Government.

Labour productivity growth is influenced by many factors, including capital intensity, training and education and composition of the workforce. Over the last 30 years Australia's labour productivity growth has averaged around 1.4 percent per annum. In the 'base case' Australian labour productivity growth is to be at a slightly lower rate of 1.3 percent per annum.

Table B.1. Base Case Economic Growth Assumptions

Region	Average Annual Growth (%)
NSW	2.0%
Australia	2.9%

Source: Prime Research (unpublished).

A constrained labour mobility assumption has been utilised between States, with labour mobility assumed to be motivated by real wage differentials. Labour mobility assumptions include both inter-industry labour movement within regions as well as inter-regional and interstate labour movement. Labour is assumed to not be sufficiently mobile to remove these real wage differentials completely (i.e., in order to attract labour, real wages will increase).

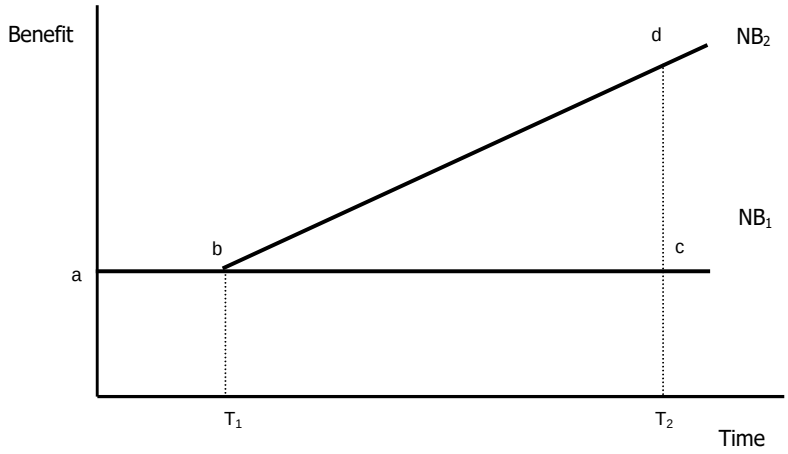
APPENDIX C: CBA METHODOLOGY

STEP 1: DEFINE THE SCOPE AND BOUNDARY

To enable a robust determination of the net benefits of undertaking a given project, it is necessary to specify base case and alternative case scenarios. The base case scenario represents the 'without project' scenario and the alternative or 'with project' scenario examines the impact with the project in place.

The base case (without) scenario is represented by line NB_1 (bc) over time T_1 to T_2 in Figure C.1. The investment in the project at time T_1 is likely to generate a benefit, which is represented by line NB_2 (bd). Therefore, the net benefit flowing from investment in the project is identified by calculating the area (bcd) between NB_1 and NB_2.

Figure C.1. With and Without Scenarios



Source: AEC.

STEP 2: IDENTIFY COSTS AND BENEFITS

A comprehensive quantitative specification of the benefits and costs included in the evaluation and their various timings is required and includes a clear outline of all major underlying assumptions. These impacts, both positive and negative, are then tabulated and where possible valued in dollar terms.

Some impacts may not be quantifiable. Where this occurs the impacts and their respective magnitudes will be examined qualitatively for consideration in the overall analysis.

Financing costs are not included in a CBA. As a method of project appraisal, CBA examines a project's profitability independently of the terms on which debt finance is arranged. This does not mean, however, that the cost of capital is not considered in CBA, as the capital expenses are included in the year in which the transaction occurs, and the discount rate (discussed below in Step 5) should be selected to provide a good indication of the opportunity cost of funds, as determined by the capital market.

STEP 3: QUANTIFY AND VALUE COSTS AND BENEFITS

CBA attempts to measure the value of all costs and benefits that are expected to result from the activity in economic terms. It includes estimating costs and benefits that are 'unpriced' and not the subject of normal market transactions but which nevertheless entail the use of real resources. These attributes are referred to as 'non-market' goods or impacts. In each of these cases, quantification of the effects in money terms is an important part of the evaluation.

However, projects frequently have non-market impacts that are difficult to quantify. Where the impact does not have a readily identifiable dollar value, proxies and other measures should be developed as these issues represent real costs and benefits.

One commonly used method of approximating values for non-market impacts is 'benefit transfer'. Benefit transfer (BT) means taking already calculated values from previously conducted studies and applying them to different study sites and situations. In light of the significant costs and technical skills needed in using the methodologies outlined in the table above, for many policy makers utilising BT techniques can provide an adequate solution.

Context is extremely important when deciding which values to transfer and from where. Factors such as population, number of households, and regional characteristics should be considered when undertaking benefit transfer. For example, as population density increases over time, individual households may value nearby open space and parks more highly. Other factors to be considered include, depending on the location of the original study, utilising foreign exchange rates, demographic data, and respective inflation rates.

Benefit transfer should only be regarded as an approximation. Transferring values from similar regions with similar markets is important, and results can be misleading if values are transferred between countries that have starkly different economies (for example a benefit transfer from the Solomon Islands to Vancouver would likely have only limited applicability). However, sometimes only an indicative value for environmental assets is all that is required.

STEP 4: TABULATE ANNUAL COSTS AND BENEFITS

All identified and quantified benefits and costs are tabulated to identify where and how often they occur. Tabulation provides an easy method for checking that all the issues and outcomes identified have been addressed and provides a picture of the flow of costs, benefits and their sources.

STEP 5: CALCULATE THE NET BENEFIT IN DOLLAR TERMS

As costs and benefits are specified over time it is necessary to reduce the stream of benefits and costs to present values. The present value concept is based on the time value of money – the idea that a dollar received today is worth more than a dollar to be received in the future. The present value of a cash flow is the equivalent value of the future cashflow should the entire cashflow be received today. The time value of money is determined by the given discount rate to enable the comparison of options by a common measure.

The selection of appropriate discount rates is of particular importance because they apply to much of the decision criteria and consequently the interpretation of results. The higher the discount rate, the less weight or importance is placed on future cash flows.

The choice of discount rates should reflect the weighted average cost of capital (WACC). For this analysis, a base discount rate of seven percent has been used to represent the minimum rate of return, which is in line with NSW and Australian Government guidelines. As all values used in the CBA are in real terms, the discount rate does not incorporate inflation (i.e., it is a real discount rate, as opposed to a nominal discount rate).

To assess the sensitivity of the project to the discount rate used, discount rates either side of the base discount rate (seven percent) have also been examined (four percent and ten percent).

The formula for determining the present value is:

$$PV = \frac{FV_n}{(1+r)^n}$$

Where:

PV = present value today

FV = future value n periods from now

r = discount rate per period

n = number of periods

Extending this to a series of cash flows the present value is calculated as:

$$PV = \frac{FV_1}{(1+r)^1} + \frac{FV_2}{(1+r)^2} + \cdots + \frac{FV_n}{(1+r)^n}$$

Once the stream of costs and benefits have been reduced to their present values the Net Present Value (NPV) can be calculated as the difference between the present value of benefits and present value of costs. If the present value of benefits is greater than the present value of costs, then the option or project would have a net economic benefit.

In addition to the NPV, the internal rate of return (IRR) and benefit-cost ratio (BCR) can provide useful information regarding the attractiveness of a project. The IRR provides an estimate of the discount rate at which the NPV of the project equals zero, i.e., it represents the maximum WACC at which the project would be deemed desirable. However, in terms of whether a project is considered desirable or not, the IRR and BCR will always return the same result as the NPV decision criterion.

STEP 6: SENSITIVITY ANALYSIS

Sensitivity analysis allows for the testing of the key assumptions and the identification of the critical variables within the analysis to gain greater insight into the drivers to the case being examined.

A series of Monte Carlo analyses has been conducted to test the sensitivity of the model outputs to changes in key variables. Monte Carlo simulation is a computerised technique that provides decision-makers with a range of possible outcomes and the probabilities they will occur for any choice of action. Monte Carlo simulation works by building models of possible results by substituting a range of values – the probability distribution – for any factor that has inherent uncertainty. It then calculates results over and over, each time using a different set of random values from the probability functions. The outputs from Monte Carlo simulation are distributions of possible outcome values.

During a Monte Carlo simulation, values are sampled at random from the input probability distributions. Each set of samples is called an iteration, and the resulting outcome from that sample is recorded. Monte Carlo simulation does these hundreds or thousands of times, and the result is a probability distribution of possible outcomes. In this way, Monte Carlo simulation provides a comprehensive view of what may happen. It describes what could happen and how likely it is to happen.

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