



MANDALONG SOUTHERN EXTENSION

ENVIRONMENTAL IMPACT STATEMENT

VOLUME 1



Centennial Coal

Mandalong Southern Extension Project

Environmental Impact Statement

September 2013

Prepared on behalf of:

Centennial Mandalong Pty Limited



By:-

GSS Environmental



GSS ENVIRONMENTAL
Environmental, Land and Project
Management Consultants

GSS Environmental a Division of SLR Consulting Australia
Pty Ltd (ABN 29 001 584 612) Effective 3 November 2012



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Submission of Environmental Impact Statement (EIS)

Prepared under Part 4 of the *Environmental Planning and Assessment Act 1979*

EIS Prepared By:

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Development Application:

Proponent Name: Centennial Mandalong Pty Limited

Proponent Address: PO Box 1000, Toronto NSW 2283

Land to be Developed: See **Figure 2**
Local Government Areas of Lake Macquarie and Wyong

Development Description: Mandalong Southern Extension Project

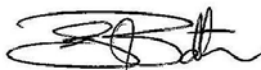
Declaration:

We hereby certify that we have prepared the contents of this document and to the best of our knowledge:

- It contains all available information that is relevant to the environmental assessment of the proposed development to which the document relates; and
- It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Name: GSS Environmental (a division of SLR Consulting Australia)
Eryn Bath

Signature:



Date: September 2013

EXECUTIVE SUMMARY

INTRODUCTION

Mandalong Mine is an existing underground coal mine operation located in the Lake Macquarie Local Government Area. It is approximately 130 kilometres north of Sydney and 35 kilometres south-west of Newcastle near Morisset in New South Wales (NSW). Centennial Mandalong Pty Limited (Centennial Mandalong) is the operator of Mandalong Mine.

Mandalong Mine was originally granted Development Consent DA 97/800 by the then Minister for Urban Affairs and Planning on 14 October 1998 under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) following the submission of the *Cooranbong Colliery Life Extension Project Environmental Impact Statement* (Umwelt (Australia) 1997) and a Commission of Inquiry. The currently approved Mandalong Mine comprises the underground workings and surface infrastructure of the following:

- The Mandalong Mine, including the Mandalong Mine Access Site, encompassing underground workings and associated surface infrastructure near Morisset; and
- The Cooranbong Entry Site encompassing a coal delivery system and surface infrastructure (coal handling and processing) near Dora Creek; and

The other operations directly related to the currently approved Mandalong Mine are the two components which comprise the Delta Link Project, namely:

- The construction and use of the Mandalong Coal Delivery System for the underground transportation of coal from the Mandalong Mine to the Delta Entry Site; and
- The receipt and handling of coal at the Wyee Coal Handling Plant at the Delta Entry Site.

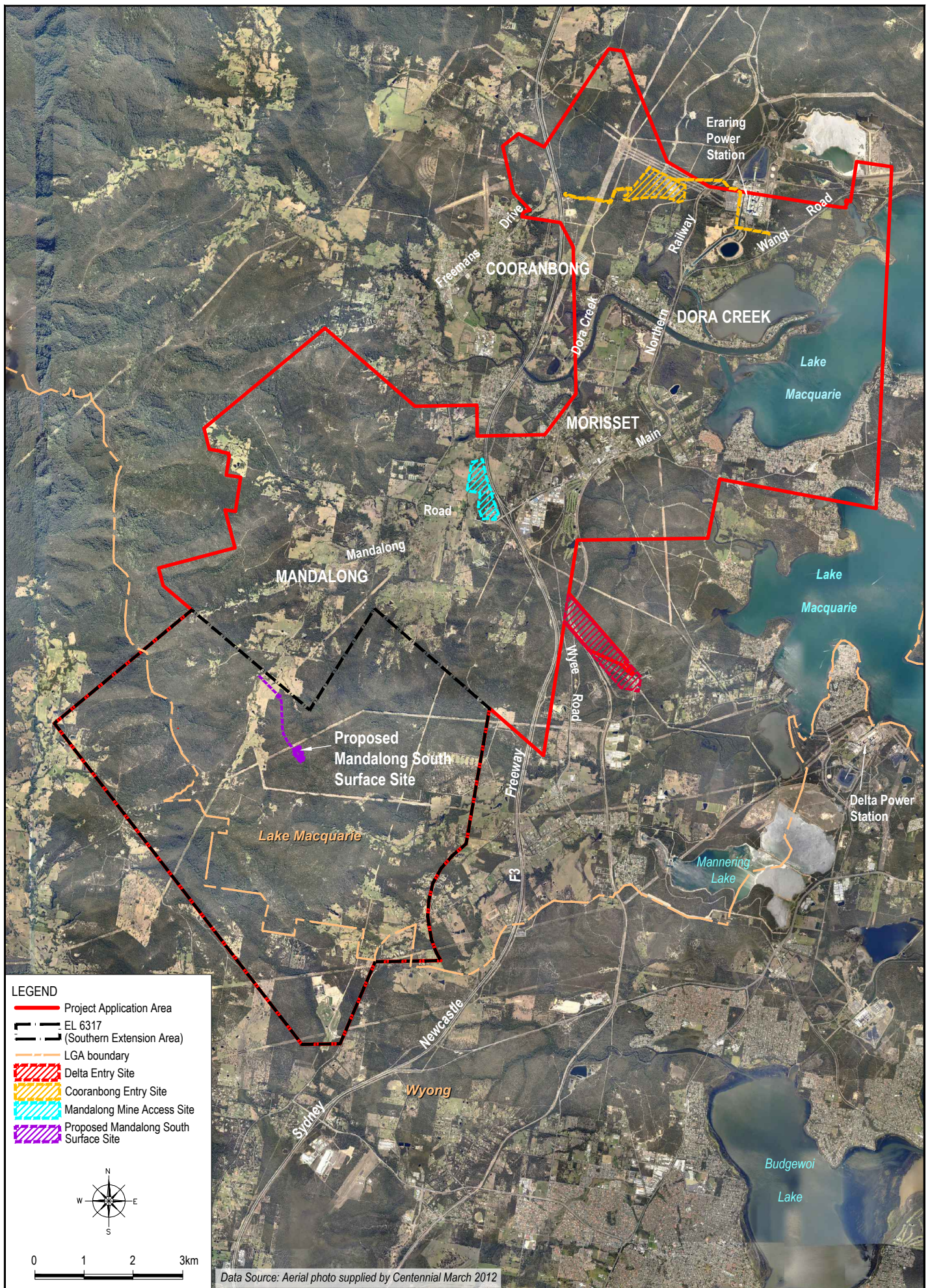
Underground longwall mining operations commenced at Mandalong Mine in January 2005. Since this time, Centennial Mandalong has extracted up to 6 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from the West Wallarah Seam utilising a combination of longwall and continuous mining methods.

This Environmental Impact Statement (EIS) has been prepared by GSS Environmental (GSSE) to support an application by Centennial Mandalong seeking a new development consent under Part 4 of the EP&A Act for the Mandalong Southern Extension Project (the Project).

PROJECT APPLICATION AREA

As shown on **Figure A**, the Project Application Area comprises:

- The existing Mandalong Mine, including Mandalong Mine Access Site, encompassing underground workings and associated surface infrastructure near Morisset;
- The extent of existing workings of the Mandalong Mine;
- The extent of existing underground workings beneath the surface of the Cooranbong Entry Site near Dora Creek for water management, mine ventilation and delivery of coal, along with the mine ventilation shaft, ventilation fan and Borehole Dam at the surface of the Cooranbong Entry Site;
- The proposed Mandalong Southern Extension Project mining area within Exploration Licence 6317 (EL 6317), which is referred to as the Southern Extension Area; and
- The proposed new surface facilities site, referred to as the Mandalong South Surface Site, within the Southern Extension Area.



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Although the surface footprint of the Cooranbong Entry Site and Delta Entry Site are located within the Project Application Area (see **Figure A**), the infrastructure and operations at the surface of these sites do not form part of the Mandalong Southern Extension Project. The exceptions to this are the mine ventilation shaft, ventilation fan and Borehole Dam at the surface of the Cooranbong Entry Site.

THE PROJECT

Centennial Mandalong seeks a single new development consent for the Mandalong Southern Extension Project to regulate its approved existing mining operations, extend existing underground mining operations into the Southern Extension Area and utilise existing and proposed new surface infrastructure integral to the mining operation. The primary components of the Project are:

- Continue the currently approved operations at the Mandalong Mine, with the exception of the infrastructure and operations at the surface of the Cooranbong Entry Site (however the mine ventilation shaft, ventilation fan and Borehole Dam at the surface of the Cooranbong Entry Site are part of the Project);
- Extend the Mandalong Mine's underground mining operations into the area covered by EL 6317 (Southern Extension Area) using a combination of continuous miner and longwall mining methods;
- Extract up to 6 Mtpa of ROM coal from the West Wallarah and Wallarah-Great Northern Seams within the current mining lease areas and the area covered by EL 6317;
- Deliver ROM coal from the underground workings to the Cooranbong Entry Site at a rate of up to 6 Mtpa and to the Delta Entry Site at a rate of up to 6 Mtpa;
- Continue to utilise the existing surface infrastructure of the Mandalong Mine Access Site;
- Install and operate surface infrastructure at the proposed Mandalong South Surface Site to service the extended underground mining operation;
- Increase manning to 420 full-time employees and up to 50 contractors during longwall relocations;
- Undertake on-going exploration drilling activities within the bounds of Centennial Mandalong's mining leases and exploration licences;
- Increase the life of mine to 25 years from the granting of a mining lease(s) over EL 6317; and
- Continue to operate 24 hours per day, seven days per week.

ENVIRONMENTAL IMPACTS

The potential environmental impacts of the Mandalong Southern Extension Project have been identified and assessed in accordance with the EP&A Act and the Director General's Requirements (DGRs), as well as current industry standards, guidelines and policies. The process has involved the following:

- An iterative process to develop and refine the mine design to minimise subsidence and associated impacts on the natural and built environment based on information obtained from the exploration drilling program, baseline environmental surveys and development of the subsidence model;
- A qualitative risk assessment to identify those issues relating to the Project that represent the greatest risk to the local environment and surrounding populace;
- Consultation with the community, government agencies and other stakeholders with an interest in the Project to identify any additional issues and concerns;
- Specialist assessment of the key issues in accordance with current best practice and quantification of the potential environmental impacts; and
- A commitment to implement a suite of operational mitigation measures, monitoring activities and management strategies for all activities associated with the Project.

The most significant findings and conclusions of the environmental impact assessment presented in this EIS are summarised in **Table A**.

Table A – Significant Findings of Environmental Impact Assessment

Overview of Key Findings
Groundwater <ul style="list-style-type: none"> Groundwater inflows into the underground workings over the life of the Project are predicted to increase from approximately 3 megalitres per day (in 2018) to 5.9 megalitres per day (in 2035-36). Impacts to groundwater sources have been assessed to be less than the Level 1 minimal impact considerations from the Aquifer Interference Policy and are therefore considered to be acceptable. Any impacts on potential groundwater dependent ecosystems, basic landholder rights and existing registered bores are expected to be minor and acceptable.
Surface Water <ul style="list-style-type: none"> No significant adverse impacts on the existing catchment boundaries and watercourse alignments are anticipated. Limited potential for changes to water quantities, including annual flow volumes, baseflows and environmental flows. On this basis, downstream users are unlikely to experience significant changes to water availability. The potential impacts on the stability of watercourses are relatively minor and the potential for the Project to degrade existing water quality is considered relatively minor. The Project is anticipated to have a negligible impact on remnant ponding, with a total increase in area of approximately 3.6 hectares (i.e. an increase of less than 2 percent). Maximum flood depths for the 100 year Average Recurrence Interval (ARI) design storm event are predicted to increase by 0.1 and 0.4 metres within the main channels of the watercourses within the Southern Extension Area. There should be no significant impact on the duration of flooding, with minor flood events remaining in channel and no discernible increase to the time out of bank for larger flood events. The flooding regimes are unlikely to have a significant impact on the habitability or access to dwellings, with all of the identified dwellings outside of the modelled flood extent for the 100 year ARI design storm event.
Water Management <p><u>Cooranbong Entry Site</u></p> <ul style="list-style-type: none"> The increased discharged through licensed discharge point LDP001, primarily as a result of mine water make in the existing and proposed underground workings, will: <ul style="list-style-type: none"> Increase the water level in Muddy Lake by a maximum of approximately 30 millimetres. Given the natural variation in levels in Muddy Lake, the predicted increases to the swamp like environment of Muddy Lake are expected to have minimal impact on the existing ecology. Result in no detectable changes in water level at the aqueduct that conveys flows from Muddy Lake over the Eraring Power Station Inlet Channel. The existing discharge at LDP001 results in no acute toxicity and slight chronic toxicity to macro-invertebrate species tested downstream. However, since there will be a gradual increase in the average daily discharge rate at LDP001, there will potentially be an increase in the load of metals and salt discharged to the unnamed creek. No significantly changes to annual flow volumes, base flows, environmental flows and the water available for extraction by licenced surface water users are expected. <p><u>Mandalong Mine Access Site</u></p> <ul style="list-style-type: none"> There are no potential impacts to downstream water quality or water users identified. <p><u>Mandalong South Surface Site</u></p> <ul style="list-style-type: none"> There are no potential impacts to downstream water quality or water users identified.
Flora and Fauna <p><u>Mandalong South Surface Site and Access Road</u></p> <ul style="list-style-type: none"> This disturbance assessment area comprises approximately 15.6 hectares of MU 15: Coastal Foothills Spotted Gum - Ironbark Forest, which is very common and widespread in the locality. The proposed works will remove a proportionally small area (less than 1 percent) of potential habitat within the wider context of the local native vegetation. The disturbance footprint will result in the removal of nine hollow-bearing trees. No significant impact upon threatened species, populations or ecological communities listed under the <i>Threatened Species Conservation Act 1995</i> (TSC Act) or <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) is expected.

Subsidence

- Surface cracking is anticipated to cause only minor modifications to habitats within the Southern Extension Area and those species reliant on these habitats are unlikely to be significantly affected.
- Subsidence is expected to have a minor or temporary effect on ponding within the local watercourses and is not likely to significantly affect riparian vegetation, endangered ecological communities (EECs) or threatened species or their habitat.
- The predicted impacts on groundwater dependent ecosystems (GDEs) as a result of subsidence (including changes to alluvial groundwater movements and/or quality) are minor. The extent of these impacts is not expected to significantly alter the vegetation composition of the GDEs or their habitat value for flora and fauna species.

Discharge in to Muddy Lake (at Cooranbong Entry Site)

- The increase in discharge will cause a modest change in the natural discharge regime through the upper reaches of the waterway and potentially a low level change further downstream. However, discharge flows will be of low energy and would be incapable of generating any significant geomorphic response, and no significant impact on the morphology of the downstream waterway is expected.
- Due to the extended duration of the predicted increased water levels there is likely to be a gradient shift within the aquatic and riparian vegetation communities of Muddy Lake as they adjust to the altered flow regimes. The increase in water flow is not considered to be large enough to have any significant impact to the aquatic and riparian vegetation within the wetland environment of Muddy Lake.

Aboriginal Heritage

- The proposed Mandalong South Surface Site is in close proximity to eight identified Aboriginal cultural heritage sites and the disturbance footprint crosses three areas with potential for archaeological deposit. Centennial Mandalong will undertake additional archaeological testing prior to construction.
- A total of 13 sites (12 percent of the 113 identified sites) are likely to be impacted by surface cracking and erosion damage, and an additional 15 sites (13 percent of the 113 identified sites) may possibly be impacted by surface cracking and erosion damage. The remaining 85 Aboriginal heritage sites are unlikely or very unlikely to be impacted by the Project.

Noise

- The construction noise predictions indicate that it is likely that some residents will be “noise affected” during the construction of the access road and site excavation at the proposed Mandalong South Surface Site. However, with appropriate design and location of temporary noise barriers, it is predicted that a reduction of up to 10 dBA would be achievable.
- Shaft sinking activity at the Mandalong South Surface Site outside of standard recommended hours is likely to marginally exceed (by 1 dBA) the relevant “noise affected” level at R20 on Toepfers Road. However, with the inclusion of a temporary noise barrier, total noise emission from shaft sinking activity will be compliant with the relevant noise goal.
- The results of the operation noise modelling indicated that the relevant intrusive and amenity noise criteria will be achieved at all the nearest residential locations.

Air Quality

- Incremental and cumulative annual average dust deposition, total suspended particulates (TSP) and PM₁₀ (particulate matter less than ten microns in diameter) concentrations, along with annual average PM_{2.5} (particulate matter less than two and a half microns in diameter) concentrations, for the assessed construction and operation scenarios at all nominated residences/properties are predicted to be well below the relevant criteria.
- The predicted maximum 24-hour average PM_{2.5} cumulative concentrations for the assessed construction and operation scenarios are predicted to exceed the advisory reporting standards at three nominated receptors (R6, R7 and R8) surrounding the existing Mandalong Mine Access Site.
- The adopted 99th percentile 1-hour average odour criterion is predicted to be exceeded at eight sensitive receptors (R1 to R3 and R6 to R10) in the vicinity of the Mandalong Mine Access Site for the assess construction and operation scenarios.
- The nitrogen dioxide, carbon monoxide and sulphur dioxide concentrations are predicted to be below the project criteria at all sensitive receptors during the assessed operation scenarios.

Greenhouse Gas

- The predicted Scope 1 and Scope 2 emissions associated with the Project amount to approximately 0.24 percent of the National total emission inventory, which is considered materially insignificant.

Traffic and Transport

- The construction and operation phases of the Project will not adversely impact the local road network.

Where there is potential for adverse environmental impact, Centennial Mandalong has committed to the implementation of operational mitigation measures, monitoring activities and management strategies for all activities associated with the Mandalong Southern Extension Project.

PROJECT BENEFITS

Benefits of the Project include:

- Sustaining the current and expanded workforces at Mandalong Mine.
- The mine plan has been designed to maximise resource recovery while at the same time minimising subsidence and associated impacts on the natural and built environment and mitigating impact on social amenity.
- The majority of the Southern Extension Area will remain unchanged as a result of the Project. This includes existing land use, rural characteristic, the manner in which residents and visitors access and move around the area, and the aesthetic quality of the area.
- The impact to social amenity across the Southern Extension Area will be minimal, with no change to the day to day life of residents. There will be no additional demand for services or facilities.
- Improved water management across the Project and at the Cooranbong Entry Site, which will water quality by increasing the settling of water prior to discharge, reducing total metal concentrations and indirectly mitigating dissolved metal concentrations.
- Scope for the continued trialling of the ventilation air methane regenerative after burner (VAM-RAB) technology as a viable strategy for the capture and abatement of ventilation air methane (VAM) from underground mining operations in the future.
- The opportunity to provide the Aboriginal community with access to Centennial-owned land within the Southern Extension Area that comprises a number of Aboriginal sites.
- The opportunity to develop and implement a mutually agreeable planning agreement with Lake Macquarie City Council, which is aimed at providing and/or improving public amenities and public services.

Mandalong Mine's current Development Consent DA 97/800 expires on 14 October 2019 and Centennial Mandalong expects to have extracted the final approved longwall panel at Mandalong Mine in 2018. Expiration of the development consent and cessation of mining would necessitate the closure of Mandalong Mine, with all economic and related benefits ceasing beyond this time.

The Project will facilitate the recovery of additional economic and valuable coal reserves that are high in heat energy and low in ash content, making it ideal for electricity generation. The Project will enable the on-going underground mining operations and continuity of coal production beyond the currently projected life of mine. It will maximise the use of existing underground and surface infrastructure.

There are benefits in terms of the continued operation of Mandalong Mine and the associated revenues. The current and expanded workforces that will be sustained by the Project will benefit, and the incomes that they derive will result in further induced benefit across the regional community as a result of the "pay packet effect" of the consumption activity of these employees in local and regional economies (Aigis Group 2013). The total number of employees at Mandalong Mine will increase by 115 full-time equivalent employees, from the current 305 full-time equivalent employees to 420 full-time equivalent employees. Up to an additional 50 contractors (12 full-time equivalent positions) will be employed during longwall moves. Furthermore, the construction program for the proposed Mandalong South Surface Site will result in the employment of 35 contractors (on average) over the total 2.5 year construction program.

In addition to the direct economic benefits, there will be broader benefits to the State in the form of royalty revenues and taxes associated with the continuation of coal production at Mandalong Mine. The net economic benefit of the Project for the State and regional communities is positive, at a net present value (NPV) of \$665 million.

The extended economic analysis under by Aigis Group (2013) by applying output and employment multipliers for mining and mining-related services indicates that the estimated net benefit of the Project (\$665 million) would result in extended economic effects of approximately 2.1 to 4.4 times the initial stimulus, dependent on the economic measure being considered. Employment of the magnitude of approximately 2.7 to 4 times the economic stimulus would also result (Aigis Group 2013). These indirect positions represent employment supported in the broader economy as a result of the demand for additional goods and services related to the Project.

CONCLUSION

The Mandalong Southern Extension Project has been assessed in this EIS in accordance with the EP&A Act, the DGRs, correspondence from other government agencies and the outcomes of community consultation. It is concluded that the overall balance of environmental, social and economic impact of the Project is positive.

The potential environmental impacts of the Project have been minimised by the iterative process Centennial Mandalong has undertaken to develop and refine the mine design to minimise subsidence and associated impacts. The Project, as designed, represents the best of the alternatives considered when taking the economic, environmental and social impacts and benefits in to consideration.

The Project will enable the on-going operations and continuity of coal production beyond the currently projected life of Mandalong Mine. The net impact of the Project to the local, regional and NSW communities, and to the National economy, will be positive. The impacts to existing land use, social amenity and aesthetic quality within the Project Application Area will be minimal, and there will be no additional demand for services or facilities. On this basis, it is concluded that the potential impacts associated with the Project are of a lesser magnitude than the benefits that will be generated by the Project.

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