Appendix 1

Key Differences between the 2013 Project and the Amended Project

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A1.1 INTRODUCTION

This appendix presents a compilation of the key differences between the 2013 Project and the amended Project together with the differences with respect to the environmental outcomes for each environmental discipline.

Table A1.1 presents a greater level of detail than is presented in **Table 1.1** when comparing the 2013 Project and the amended Project.

Table A1.2 presents a compilation of the key differences assembled by the respective Specialist Consultants in relation to:

- Noise and Blasting
- Air Quality
- Health
- Visibility
- Groundwater
- Surface Water
- Traffic
- Terrestrial Ecology
- Aquatic Ecology
- Agricultural Impacts
- Social Impacts
- Economic Impacts

The Soils Assessment was expanded to include an assessment of the area proposed for the private haul road, however the conclusions of this additional assessment matched the conclusions for the 2013 Project and the assessment of the Mine Area and power line corridors. As no key differences were identified, this aspect has been excluded from **Table A1.2**.

No additional investigations were required for the characterisation of the overburden and rejects generated. Hence, the assessment undertaken by RGS Environmental (2016) has only required adjustment to reflect the absence of an on-site CHPP and the generation of breaker rejects. Therefore no key differences have been recorded in **Table A1.2.**

No differences have arisen in the Historic Heritage Assessment for the amended Project although the report also assessed the amended Project in accordance with the Heritage Council of Victoria guideline entitled "*Landscapes of Cultural Heritage Significance Assessment Guidelines*" released in 2015. The conclusions of this assessment were consistent with those made for the 2013 Project, therefore no key differences have been recorded in **Table A1.2.**

Table A1.1
Key Differences between the 2013 Project and Amended Project*

Project Component	2013 Project	Amended Project
In Situ Coal Resource	• 25 million tonnes (7 coal seams targeted) • 130 million bcm overburden	• 21 million tonnes (6 coal seams targeted) • 126 million bcm overburden
Approval Sought for Maximum ROM Coal Production	• 2.5 million tonnes per year	• 2.0 million tonnes per year
Projected Product Coal Production	• 1.75 million tonnes per year	• 1.3 million tonnes per year
Mine Life	• Mining operations = 14 years • 21 year Development Consent sought	• Mining operations = 16 years • 21 year Development Consent sought
Capital Investment Value	• $164.4 million (2013 dollars)	• $90.3 million (2016 dollars)
Open Cut Mining	• Three contiguous open cut pits and one stand-alone open cut pit (Weismantel Pit). Two sub-pits were proposed within the Main Pit. • Depth of open cut pits – 70m to 190m.	• Three contiguous open cut pits (Avon Pit, Bowen Road Pit and Main Pit) (Weismantel Pit removed). • Depth of open cut pits – 80m to 220m.
Mining Equipment Deliveries (on low loaders, etc.)	• Via Jacks Road and Waukivory Road.	• Via Stratford Mining Complex and private haul road.
Amenity Barriers	• Three barriers – western and northern amenity barrier, central visibility barrier, eastern visibility barrier – generally aligned north-south.	• Three barriers – western and northern amenity barrier, northern and southern interim amenity barriers generally aligned northeast to southwest (re-designed to maximise effectiveness, remove linearity, incorporate more variability and create a more natural appearance).
Annual Sequence of Surface Disturbance	• **Figure 2.16** – completed in 13 years	• **Figure 2.10** – completed in 11 years
Coal Processing	• An on-site CHPP generating product coal for rail despatch off site to export market. The Site workshop was located near the CHPP.	• An on-site rotary breaker designed to reduce the size of all coal to <120mm and remove contaminating rock. • Processing of sized ROM coal at the CHPP at the Stratford Mining Complex.
Coal Products	• Approximately 90% coking coal, 10% thermal coal.	• Approximately 95% of high fluidity coking coal, 5% thermal coal.
Product Coal Transportation	• Transported using an overland conveyor from the CHPP to a rail load-out bin and a dedicated new rail loop and rail load-out facility approximately 2km west of the Mine Area.	• No product coal produced on site • Product coal from Stratford Mining Complex despatched using existing rail load-out facility and rail loop within the Stratford Mining Complex.

Table A1.1 (Cont'd)
Key Differences between the 2013 Project and Amended Project*

Project Component	2013 Project	Amended Project
Administration Area	• Site offices, amenities and ancillary facilities.	• Site offices, amenities, workshop, water treatment plant and ancillary facilities.
ROM Coal Transportation	• All ROM coal delivered by haul trucks to the on-site CHPP.	• All ROM coal delivered to rotary breaker with sized coal (90% ROM coal) transported via a private haul road to the Stratford Mining Complex.
Saline Water Management	• Contained on site within dams and open cut pits.	• Contained on site within dams and/or treated on site – with treated water used for irrigation of rehabilitated areas and on adjoining land.
Processing Rejects	• Fine and coarse rejects produced in the CHPP would be mixed with overburden in the on-site emplacements.	• The coarse (rock) reject produced by the rotary breaker would be mixed with the overburden in the on-site emplacements. • CHPP rejects managed at Stratford Mining Complex.
Maximum Workforce	• Construction = 100 persons • Operations = 150 persons	• Construction = 60 persons • Operations = 110 persons
Proposed Operational Hours	• Mining (6 days/week): – Years 1 and 2: 7:00am to 10:00pm (i.e. day/evening) – Years 3 to 14: 7:00am to 4:00am (i.e. day/evening/night) • Coal despatch (7 days/week) – Anytime (24 hours/day)	• Mining (6 days/week): – Years 1 to 3: 7:00am to 6:00pm (i.e. day only) – Years 4 to 16: 7:00am to 10:00pm (i.e. day/evening) – No night-time operations • Coal transport to Stratford Mining Complex (6 days/week) – 7:00am to 6:00pm
Final Landform	• Free draining landform with slight increases in slopes on the western side of the permanent overburden emplacement.	• Free draining landform with slight increases in slopes on the western side of the permanent overburden emplacement. • Minor changes above the backfilled Main Pit.
Biodiversity Offset Area	• 267ha	• 267ha

* This table expands upon **Table 1.1**

Table A1.2
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Noise		
Hours of Operation		
Construction	Daytime	Daytime
Operations	Daytime, evening and night-time	Daytime and evening (only)
Noise Modelling and Meteorological Parameters		
Noise Model	RTA's ENM	RTA's ENM
Meteorology	Meteorology used to calculate the 10th percentile exceedance noise level based in 12 months historical meteorological data	In accordance with the INP to determine calm and adverse winds based on 59 months of meteorological data collected on site between 2010 and 2016
Adopted Intrusive Project Specific Noise Levels (PSNLs)		
Adjacent The Bucketts Way	Daytime 43dB(A) Evening 35dB(A), Night-time 35dB(A)	Daytime 40dB(A) (i.e. 3dB(A) lower) Evening 35dB(A)
Gloucester residences	Daytime 40dB(A) Evening 35dB(A), Night-time 35dB(A)	Daytime 37dB(A) (i.e. 3dB(A) lower) Evening 35dB(A)
Jacks Road residences	Daytime 36dB(A) Evening 35dB(A), Night-time 35dB(A)	Daytime 35dB(A) (i.e. 1dB(A) lower) Evening 35dB(A)
Other rural residences	Daytime 35dB(A) Evening 35dB(A), Night-time 35dB(A)	Daytime 35dB(A) (no change) Evening 35dB(A)
Mobile Equipment Items, Sound Power Levels (SWL) and Mitigation		
Maximum Number of Items	Daytime – 35 items Evening – 34 items	Daytime – 38 items Evening – 34 items
Total SWL	Estimated total SWL 129dB(A) (excluding CHPP, overland conveyor, rail loop and rail load-out facility)	Daytime total SWL 130dB(A) Evening total SWL 129dB(A)
Noise Mitigation	Based upon 2013 mine design	Based upon 2016 mine design
Site Establishment and Construction Noise		
	Included in Year 1 assessment	Assessed separately in accordance with the ICNG (i.e. not part of Year 1 mining)
Privately-owned Residences with intrusive PSNL exceedances		

	Noise Management Zone		**Affectation**	**Noise Management Zone**		**Affectation**
	1 to 2dB(A) above PSNL	3 to 5dB(A) above PSNL	5dB(A) above PSNL	1 to 2dB(A) above PSNL	3 to 5dB(A) above PSNL	5dB(A) above PSNL
Daytime	7, 18, 19A, 23, 56A, 154, 193	18, 19A, 23	6, 23	6, 19A	-	nil
Evening	7, 154, 163A, 183, 184B, 193	6, 18, 19A, 23, 56A	nil	7	6	nil
Night-time	7, 154, 163A, 163B, 184B, 193	23, 183, 184B	6, 18, 56A	Not Applicable (no night-time operations)		

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Noise (Cont'd)		
Blasting Impacts		
Airblast Overpressure and Ground Vibration	Acceptable	Acceptable
Traffic Noise		
All Roads	Acceptable	Acceptable
Air Quality		
Total TSP Emissions	Year 2.5 928,599kg/yr Year 4.25 1,206,281kg/yr Year 7.75 990,527kg/yr Year 13 822,834kg/yr	Year 1 267,818kg/yr Year 4 740,503kg/yr Year 7 1,049,915kg/yr Year 10 807,789kg/yr
Blasting & Diesel Combustion	Blast fumes assessed, however, no consideration of diesel combustion sources generating $PM_{2.5}$ and NO_2. No cumulative NO_2 assessment.	Assessment of blast fumes and diesel combustion. Assessment of diesel conducted based upon the worst affected private residence during the year with highest diesel consumption. Cumulative NO_2 assessment completed.
Maximum Predicted Particulate Concentrations at Privately-Owned Residences[1]		
TSP – Annual Average (Cumulative)	Residence 18 - 66μg/m^3 (Year 4.25)	Residence 18 – 39μg/m^3 (Year 7)
PM_{10} – Maximum 24 hour Average (Project-only)	Residence 18 - 86μg/m^3 (Year 13)	Residence 6 - 35μg/m^3 (Year 7)
PM_{10} – Annual Average (Cumulative)	Residence 18 - 35μg/m^3 (Year 4.25)	Residence 18 - 15μg/m^3 (Year 7)
$PM_{2.5}$ – Maximum 24 hour Average (Project-only)	Residence 18 - 12μg/m^3 (Years 4.25 & 13)	Residence 6 - 6μg/m^3 (Year 7)
$PM_{2.5}$ – Annual Average (Cumulative)	Residence 18 - 7.4μg/m^3 (Year 4.25)	Residence 18 - 5.6μg/m^3 (Year 10)
Deposited Dust (Cumulative)	Residence 18 - 1.6g/m^2/month (Years 4.25, 7.75 & 13)	Residence 18 - 1.3g/m^2/month (Years 7 & 10)

[1] Results for the 2013 Project based upon modelling completed as part of the Response to Submissions.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

<table>
<tr><th>Project Component</th><th colspan="3">2013 Project</th><th colspan="3">Amended Project</th></tr>
<tr><td colspan="7">Air Quality (Cont'd)</td></tr>
<tr><td colspan="7">Privately-Owned[2] Residences at Which Exceedances Occur</td></tr>
<tr><td>PM_{10} – Maximum 24 hour Average
(Project Alone)</td><td colspan="3">Year 4.25 – Residence 6
Year 7.75 – Residence 6
Year 13 – Residence 6</td><td colspan="3">No exceedances</td></tr>
<tr><td>PM_{10} – Annual Average
(Project Alone)</td><td colspan="3">Year 2.5 – Residences 6 & 18
Year 4.25 – Residences 6, 18 & 19A
Year 7.75 – Residences 18 & 19A
Year 18 – Residences 18 & 19A</td><td colspan="3">No exceedances</td></tr>
<tr><td rowspan="11">PM_{10} – Maximum 24 hour Average
(Monte Carlo Simulation)</td><td>Residence</td><td>Predicted Days Over 50µg/m^3 (Project-only)</td><td>Predicted Days Over 50µg/m^3 (cumulative[#])</td><td>Residence</td><td>Predicted Days Over 50µg/m^3 (Project-only)</td><td>Predicted Days Over 50µg/m^3 (cumulative)[#]</td></tr>
<tr><td colspan="3">Year 2.5</td><td colspan="3">Year 7</td></tr>
<tr><td>6</td><td>1</td><td><1*</td><td>18</td><td>0</td><td><1*</td></tr>
<tr><td colspan="3">Year 4.25</td><td>23</td><td>0</td><td><1*</td></tr>
<tr><td>154</td><td>0</td><td><1*</td><td colspan="3">Year 10</td></tr>
<tr><td>164</td><td>0</td><td><1*</td><td rowspan="3">6</td><td rowspan="3">0</td><td rowspan="3"><1*</td></tr>
<tr><td colspan="3">Year 13</td></tr>
<tr><td>18</td><td>5</td><td>23</td></tr>
<tr><td colspan="6">*reported as less than one day due to statistical determination of cumulative frequency of exceedance of 50µg/m^3 calculated as less than 1
[#]Cumulative = as a consequence of emissions from the Proposal + SMC + existing ambient.</td></tr>
<tr><td rowspan="7">NO_2 Resulting from Blasting (including background)</td><td>Residence</td><td>Year 2.5</td><td>Year 4.25</td><td colspan="3" rowspan="7">No exceedances</td></tr>
<tr><td></td><td colspan="2">No. of hours predicted to exceed 1-hour NO_2 criteria of 246µg/m^3</td></tr>
<tr><td>6</td><td>8</td><td>3</td></tr>
<tr><td>18</td><td>3</td><td>8</td></tr>
<tr><td>36</td><td>2</td><td>9</td></tr>
<tr><td>154</td><td>2</td><td>3</td></tr>
<tr><td>167A</td><td>1</td><td>1</td></tr>
<tr><td colspan="7">Total Mine Life Greenhouse Gas Emissions (t CO_2-e)</td></tr>
<tr><td>Scope 1</td><td colspan="3">1,576,270</td><td colspan="3">1,566,685</td></tr>
<tr><td>Scope 2</td><td colspan="3">120,091</td><td colspan="3">241,891</td></tr>
<tr><td>Scope 3</td><td colspan="3">41,713,538</td><td colspan="3">36,283,171</td></tr>
</table>

[2] Results for the 2013 Project based upon modelling completed as part of the Response to Submissions.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Health		
Assessment Locations	The considered assessment locations included 150 privately-owned residences in the vicinity of the Site and three sensitive receiver locations within Gloucester township.	The considered assessment locations included 159 privately-owned residences in the vicinity of the Site and three sensitive receiver locations within Gloucester township.
Concentration Reference Factors	The source of the Concentration Reference Factors (CRFs) used in the exposure assessment was Anderson *et al* (2004).	The source of the CRFs used in the exposure assessment was changed to Jalaludin and Cowie (2012) because the latter study outlined recommended CRFs to be used for health risk assessments in the Australian context.
Baseline Health Statistics	The baseline health statistics used were based upon the Hunter New England Local Health District for 2009-2010 and daily hospital admissions for all of NSW in 2006-2007. A total of four health endpoints were evaluated (i.e. long-term deaths, short-term deaths, hospitalisations due to cardiovascular and hospitalisations due to all respiratory disease).	The baseline health statistics used was for Tamworth given the local environment was more similar to the assessed communities i.e. State suburb of Gloucester and Faulkland State Suburb (Forbesdale Estate area). The specific health endpoint evaluated in the exposure assessment was expanded to twelve health effects.
Blasting & Diesel Combustion	Blast fumes assessed, however, no consideration of diesel combustion sources generating $PM_{2.5}$ and NO_2. No characterisation of risk for PM_{10}.	Assessment of both blast fumes and diesel combustion. The assessment of diesel was conducted based upon the worst affected private residence during the year with the highest diesel consumption. The potential additive effects of cumulative NO_2 and PM_{10} were also considered as part of the Hazard Index calculation
Data Presentation	The particulate matter and NO_2 concentrations used in the exposure assessment were presented as percentiles.	The particulate matter and NO_2 concentrations used in the exposure assessment are presented as maximum concentrations.
Health Risk Outcomes	From a health-risk perspective, the 2013 project assessed project-only particulate levels which resulted in an increase in base incidence in Gloucester State Suburb and Faulkland State Suburb (Forbesdale Estate) of less than 1 in 100,000, which is considered to be "sufficiently small and to be of no cause for concern" (NEPM AAQM).	From a health-risk perspective, the amended Project assessed cumulative particulate levels which resulted in an increase in base incidence in Gloucester State Suburb and Faulkland State Suburb (Forbesdale Estate) of less than 1 in 100,000, which is considered to be "sufficiently small and to be of no cause for concern" (NEPM AAQM). Whilst the changes in health risk are not directly comparable between the assessments, given the reductions in project-only particulate emissions, the overall health risk is likely to have similarly reduced.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Visual Impacts		
Open Cut Pits	Weismantel Pit higher elevation than contiguous pits – therefore potentially more visible.	Retention of three contiguous open cut pits at lower elevation with lower visual exposure and visual impacts.
Mine Infrastructure Footprint	Western and northern amenity barrier to maximum 155m AHD with consistent vegetation and two linear north-south aligned amenity barriers to control visibility of mining and re-contouring and rehabilitation of overburden.	Western and northern amenity barrier higher (to maximum 160m AHD), generally less steep, more variable slopes and more visually diverse with denser patches of trees. Two short southwest to northeast aligned interim amenity barriers to control visibility of overburden emplacement construction and rehabilitation activities. Therefore, visual impact mitigation would be more effective with a greater certainty as to the effectiveness of visual impacts mitigation program.
CHPP and Overland Conveyor	Shielded by western and northern amenity barrier. Night-lighting around ROM pad, CHPP and overland conveyor.	No CHPP or overland conveyor. No need for specific visual impacts mitigation measures for CHPP. No impact of night-time handling of ROM or product coal and loading/conveying product coal via overland conveyor. Product transported to Stratford Mining Complex by private haul road – visible in daytime only.
Coal Storage Bins	Surge bin (28m high) 0.6km east of The Bucketts Way and rail load-out bin visible within rail loop (but painted). Potential impacts of structures, conveyors, night-time lighting, etc.	Sized coal bin (23m high) 4.5km east of The Bucketts Way and painted. No lighting required at night as no sizing/loading activities between 6:00pm and 7:00am.
Mine Infrastructure Footprint	ROM pad, CHPP, product stockpiles, workshop, etc. (Area = 10ha). Administration Area (Area = 7.5ha).	Breaker station and sized coal bin on ROM pad only (Area = 3ha). Administration Area (Area = 10ha) marginally larger (due to workshop and water treatment plant).
Rail Load-out Facility	Excavation of cutting and construction of embankments. Increased railway activity visible (including train headlights). Lighting around facility visible. Cumulative impacts with other activities within the Mine Area.	No facility on site. Product coal despatched from existing Stratford Mining Complex. No increased railway activity visible in visual catchment of amended Project. No night-time lighting of dedicated facility necessary. No cumulative impact of railway handling of coal product.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Visual Impacts (Cont'd)		
Lighting	Potential 21 hours/day operations including mining and emplacement of overburden. Lighting in open cut pits, ROM pad/CHPP area, haul truck headlights, product coal despatch/conveyor.	Operational hours restricted to day-time and evening only for mining activity and day-time only for private haul road.
Power Line Corridors	Two power line corridors incorporating re-location of 132kV power line and new 11kV power line external to Mine Area.	Two power line corridors incorporating re-location of 132kV power line and new 11kV power line external to Mine Area – no substantive change to visual impacts.
Groundwater		
Quantity and duration of baseline monitoring data	Under 2 years of groundwater level and quality data	Over 5 years of groundwater level and quality data
Climatic data as input to the transient model	Data up to 2012	Data up to 2015
Model verification	Completed from March 2011 to December 2011 using AGL monitoring bores only.	Additional verification completed from March 2012 to October 2015 using GRL data.
Mine plan	Four open cut pits (three contiguous)	Three open cut pits - Main Pit excavated deeper (220m -v- 190m)
Mine schedule	14 years mining	16 years mining
Predicted cumulative annual inflow	8 990ML	11 640ML – due to the additional 2 years of mining operations and the slightly deeper depth of mining (220m -v- 190m).
Predicted average annual inflow	640ML	727ML – due principally to the inflows over the additional 2 years.
Predicted maximum annual inflow	1 250ML (in Year 4)	1 100ML (in Year 7)
Net Reduction in inflow to alluvium	0.05 – 0.30ML/day	0.02 – 0.53ML/day – due principally to the slightly greater depth of mining (220m -v- 190m).
Recovery level in backfilled void (and years to achieve)	117m AHD (15 years)	110m AHD (10 years)
Period for Groundwater Level Recovery	15 years	10 years

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Groundwater (Cont'd)		
Cumulative impact assessment	Inclusion of AGL and indicative plans for the Stratford Mining Complex.	Simulation of Stratford Mining Complex only, as AGL has advised they will no longer proceed with the Gloucester Gas Project. Representation of existing Stratford pits is more accurate.
Surface Water		
Climate Data as input to hydrology models	Data up to 2012	Data up to 2015
Stream flow and Water Quality Data	Data up to 2012	Data up to 2015. The additional period of data includes an extended dry period in 2014 which resulted in changes to the description of existing flow characteristics of the Avon River, with the median daily flow reducing from 24.6ML/day to 10.2ML/day.
On-site Saline Water Use	Up to 329ML/yr for dust suppression and up to 350ML/yr used in CHPP. Allowance for on-site disposal through soakage areas (in overburden) over mined-out open cut pits.	Up to 416ML/yr used for dust suppression. No CHPP, therefore less on-site water use and increased water surplus together with reduced capacity to dispose of water in mined-out open cut pits.
Water Treatment	Surplus saline water retained on site in environmental dams (no water treatment).	A water treatment plant would be used from Year 4 onwards to compensate for reduced water demand and increased inflow.
Average Annual Saline Water Accumulating in Saline Water Zone	Up to 1 304ML/yr	Up to 438ML/yr (i.e. less than 2013 Project).
Saline Water Retained on Site at the end of Coal Extraction	6 900ML	Nil – based on water balance.
Sediment Dams	18 sediment dams on site (5.9ML to 84.6ML capacity).	22 sediment dams on site (6.8ML to 82.6ML capacity). Overall, little change.
Saline Water Storage	3 Environmental Dams ED1 – 300ML capacity ED2 – 800ML capacity ED3 – 1 000ML capacity and storage in Weismantel Pit and Main Pit.	3 Environmental Dams ED1 – 310ML capacity ED2 – 1 000ML capacity ED3 – 1 550ML capacity Limited in-pit storage (Weismantel Pit not mined).
Floodplain Structures	Toe of western and northern amenity barrier and overland conveyor	Toe of western and northern amenity barrier and small embankment for Waukivory Creek bridge abutments.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Surface Water (Cont'd)		
Impacts of 1 in 100 AEP Flood Events	Minor increases in flood levels adjacent to the southern end of the western and northern amenity barrier. Little change in flood levels near support structures for overland conveyor. Localised increased flood levels in Oaky Creek.	Minor increases in flood levels adjacent to the southern end of the western and northern amenity barrier. Minor increase in flood levels of 0.5m to 1m upstream from the Waukivory Road bridge crossing – on GRL-owned land. Localised increased flood levels in Oaky Creek.
Downstream Flows	The retention of surface water within the Mine Area would reduce flows in the Avon River by up to 1.9%.	The retention of surface water within the Mine Area would reduce flows in the Avon River by up to 1.5%.
Traffic		
Road Network	The road network considered included: • The Bucketts Way; • Jacks Road; • Waukivory Road; • Fairbairns Road; and • McKinleys Lane. Intersections, bridges and rail crossings associated with these roads were also considered. The primary access route to the Mine Area was via The Bucketts Way, Jacks Road, Waukivory Road (east) and McKinleys Lane. Ambient traffic levels were presented based on traffic counts between 2008 and 2012.	The deletion of the conveyor and rail load out facility and inclusion of the private haul road to the Stratford Mining Complex are the primary differences affecting the use of the public road network. The recommended primary access route to the Mine Area remains unchanged although mining equipment would be delivered via the Stratford Mining Complex. The construction of the private haul road necessitates access via both Fairbairns Road and Wenham Cox Road. Fairbairns Road was previously considered in the 2013 assessment; however, Wenham Cox Road was not. Ambient traffic volumes presented based on traffic counts between 2008 and 2015. Traffic volumes have generally remained stable or decreased.
Road Condition	At the time of the assessment, the bridge over the Avon River on Jacks Road was closed.	The local road network inspected was found to be in a similar condition as presented in the 2013 assessment. The Jacks Road bridge was re-opened on 12 November 2014 with a 15t load limit.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Traffic (Cont'd)		
Construction Traffic Levels	Construction traffic levels expected were up to 220 traffic movements (210 light and 10 heavy vehicles) per day via McKinleys Lane. Approximately 70 traffic movements (50 light and 20 heavy vehicles) per day on The Bucketts Way for the construction of the Rail Load-out Facility. The construction traffic on Fairbairns Road would have a peak of 18 traffic movements per day.	Construction traffic levels via McKinleys Lane have slightly reduced to a peak of 190 traffic movements (158 light and 32 heavy vehicles) per day. As the Rail Load-out Facility is no longer proposed, there would not be the associated construction traffic. However, the amended Project would result in up to 40 traffic movements (24 light and 16 heavy vehicles) per day on Wenham Cox Road. Wenham Cox Road was not proposed to be utilised as part of the 2013 Project. The construction traffic on Fairbairns Road would have a peak of up to 28 traffic movements per day.
	A summary of principal changes in proposed peak traffic movements is provided as follows.	
	Peak Construction Traffic Movements* (Light vehicle / Heavy vehicle)	
	McKinleys Lane 220 (210/10) Fairbairns Road 18 (10/8) Rail Load-out Facility (off The Bucketts Way) 70 (50/20) Wenham Cox Road 0	McKinleys Lane 190 (158/32) Fairbairns Road 28 (20/8) Rail Load-out Facility (off The Bucketts Way) 0 Wenham Cox Road 40 (24/16)
	* 1 return trip generates 2 movements.	
Operational Traffic Levels	Traffic movements included between 227 and 293 light vehicle movements and 4 to 16 heavy vehicle movements per day on McKinleys Lane. Additionally, 6 to 10 light vehicle movements and 0 to 2 heavy vehicle movements per day to the Rail Load Out Facility (off The Bucketts Way) and 2 to 8 light vehicle movements and 0 to 2 heavy vehicle movements per day via Fairbairns Road would occur. The highest expected peak vehicle movements during shift changes was up to 76 vehicle movements.	Due to the reduced hours of operation, principally the removal of night time operations, both the total and peak traffic movements have reduced. Traffic movements would reduce to between 60 and 272 light vehicle movements and 2 to 14 heavy vehicle movements per day on McKinleys Lane. Traffic movements to / from the previously proposed Rail Load-out Facility (off The Bucketts Way) and via Fairbairns Road would not occur. The highest expected peak vehicle movements during shift changes is up to 42 vehicle movements. Approximately 90 heavy vehicle movements would occur in the first year via the Stratford Mining Complex and the private haul road.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Traffic (Cont'd)		
Traffic Impacts and Mitigation Measures	The following road and intersection works were proposed. • Upgrade of Jacks Road/The Bucketts Way, Jacks Road/Waukivory Road and Waukivory Road/McKinleys Lane intersections. • Upgrade of road pavement on Jacks Road and Waukivory Road (east of Jacks Road). • Replacement of the single lane Avon River bridge on Jacks Road with a dual lane structure. • A range of other minor upgrade works including line marking and signage. It was assessed that, with the implementation of the proposed upgrades and mitigation and management measures, no significant impacts were expected upon the existing road network or road users	The traffic impacts remain similar although Wenham Cox Road was not previously impacted. As the primary access route remains the same and the forecast and background traffic levels remain similar the same mitigation measures have been proposed. Use of Wenham Cox Road would be of short duration only (site establishment and construction stage - Months 2-9).
Aboriginal Cultural Heritage		
Study Area	The Study Area for the 2013 Project included the proposed locations of the Mine Area, power line corridors and the Overland Conveyor and Rail Load-Out Facility.	The Study Area for the amended Project included the Mine Area, power line corridors and a 50m wide corridor for the private haul road.
Survey Results	The results of the survey identified nine sites of Aboriginal cultural heritage significance including: • three sites previously registered on the AHIMS database; • three sites within the Mine Area; and • three Sites within the Rail Load-Out Facility.	The results of the additional surveys identified three Aboriginal cultural heritage sites, two within and one adjacent to the private haul road corridor. These were assessed in conjunction with the six sites previously identified in the Mine Area (AHIMS sites and new sites)
Management and Mitigation	Management would involve salvage and relocation of all artefacts identified within the nine sites.	Management would involve salvage and relocation of all artefacts identified within the nine sites. The three sites identified in the previous assessment of the Rail Load-Out Facility will remain in situ. Future impact to these sites would be mitigated by registration of their locations on the AHIMS database.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Terrestrial Ecology		
Study Area	The 2 030ha Study Area for the 2013 Project extended from the upper western slopes of the Mograni Range in the east to the North Coast Railway and The Bucketts Way in the west, and from the northern side of Waukivory Road in the north to the southern side of Waukivory Creek in the south. It included the potential open cut mine area of disturbance and surrounding land.	The 2 361ha Study Area comprises the entire Study Area for the 2013 report plus a broad corridor of land between the southern boundary of the Rocky Hill Mine Area and the northern boundary of the Stratford Mining Complex. This includes the proposed private haul road corridor.
Area of disturbance	The disturbance area extended from the lower western slopes of the Mograni Range in the east to the eastern and northern sides of Waukivory Creek plus an Overland Coal Conveyor corridor across the Avon River. The disturbance area also included land impacted by a rail load-out facility and rail loop west of the Avon River.	The disturbance area for the amended Project is wholly located to the east of the Avon River, with minor adjustments to the area of disturbance. Includes assessment of a private haul road corridor. The overland conveyor, rail load-out facility and rail loop are no longer included.
Threatened species considered subject species	A total of 59 threatened fauna species and 6 threatened flora species were reviewed for inclusion as subject species, plus two additional fauna species from the BioBanking Credit Calculator.	A total of 66 threatened fauna species and 18 threatened flora species were reviewed for inclusion as subject species, plus two additional fauna species from the BioBanking Credit Calculator. Threatened and migratory species listed under the EPBC Act are also included in the 2016 assessment.
Field Surveys	Surveys were conducted at various times over the years 2010, 2011 and 2012 to target specific threatened flora or fauna groups.	In addition to the surveys carried out for the 2013 assessment, supplementary field surveys comprising habitat assessment and targeted threatened species surveys within a broad corridor in the southern part of Study Area were carried out in order to inform the alignment of the proposed private haul road.
Threatened Species detected	Nine threatened fauna species were detected within the northern part of the Study Area. No threatened flora species were detected.	A total of 10 threatened fauna species were detected. One threatened species (Spotted Harrier) had not previously been detected. No threatened flora species were detected.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Terrestrial Ecology (Cont'd)		
Residual Impacts	Total area of native vegetation impacted = 51.8ha Total effective area of native vegetation impacted = 41.1ha • Dry Sclerophyll Forest (Community 2) – 46.4ha (35.7ha effective clearing area) • Riparian Forest (Community 3) – 1.1ha • Rainforest (Community 4) – 4.3ha	Total area of native vegetation impacted = 51.8ha Total effective area of native vegetation impacted = 41.5ha • Dry Sclerophyll Forest (Community 2) – 46.9ha (36.6ha effective clearing area) • Riparian Forest (Community 3) – 0.7ha • Rainforest (Community 4) – 4.2ha
Biodiversity Offsets	Ecosystem credits required/generated as calculated through the biodiversity offsetting assessment: • Dry Sclerophyll Forest (Community 2): 1 245/1 251 credits • Riparian Forest (Community 3): 28/31 credits • Rainforest (Community 4): 291/418 credits Total credits for all native vegetation communities = 1 564/1 700 credits The assessment for the 2013 Project was undertaken in accordance with the BioBanking Assessment Methodology (DECC,2009a) and BioBanking Credit Calculator (Version 2)	Ecosystem credits required/generated as calculated through the biodiversity offsetting assessment: • Dry Sclerophyll Forest (Community 2): 1 358/1 526 credits • Riparian Forest (Community 3): 26/40 credits • Rainforest (Community 4): 297/548 credits Total credits for all native vegetation communities = 1 681/2 114 credits The assessment for the amended Project was undertaken in accordance with the updated BioBanking Assessment Methodology (OEH, 2014) and BioBanking Credit Calculator (Version 4.0)
Aquatic Ecology		
On-site coal handing	Crossing of Waukivory Creek for the overland conveyor to access the rail loop and train loading system.	Crossing of Waukivory Creek for overland conveyor no longer required.
Off-site transport	New additions to rail system.	Private haul road to transport coal by truck from ROM pad to Stratford Mining Complex for processing and transport via existing rail system. Existing, dilapidated, wooden bridge over Waukivory Creek to be replaced with steel span bridge higher above water than existing bridge, with minimal or no in-stream pylons required for the steel bridge.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Aquatic Ecology (Cont'd)		
Water Treatment and Use	Re-use of water generated within the Mine Area.	Re-use of water generated within the Mine Area, with on-site treatment of saline water (mostly derived from Permian Aquifer) to produce high quality water for use on site and for off-site irrigation on nearby farm land owned by the Applicant; waste by-product formed as a solid salt product.
Agricultural Impacts		
Rocky Hill Locality	The Rocky Hill Locality equated to an area of approximately 48km^2 extending from the upper western slopes of the Mograni Range in the east, to and beyond The Bucketts Way in the west, and from the northern side of Waukivory Road in the north to the southern side of Waukivory Creek in the south. It included the Mine Area, overland conveyor and rail load-out facility.	The Rocky Hill Locality equates to an area of approximately 60km^2 and comprises the locality for the 2013 report plus a broad corridor of land between the southern boundary of the Rocky Hill Mine Area and the northern boundary of the Stratford Mining Complex. This area incorporates the private haul road corridor.
Livestock production matters considered	All of the agricultural sectors evident within the (then) Gloucester LGA were closely considered to assess both actual and potential production volumes and values. A measurement system was created to facilitate assessment of the impact of that production on agricultural labour volumes that was replicated for the locality to allow understanding and measure labour impacts from the project.	Focusses primarily on the two key agricultural industry sectors that have a significant impact within the Rocky Hill Locality and the disturbance area. The other sectors were considered but not in the same detail as the 2013 Project because an existing baseline had been established. The same assessment calculator was used to revise the employment impacts based on more recent production and sale values of the production within the locality.
Industry sectors and statistics	2006 and 2011 ABS data were used for the baseline analysis and to understand agricultural volumes. Actual physical market pricing from 2012 gleaned from industry contacts was used to extrapolate industry contributions to the economy. Much of that detail was sourced from Dairy Australia and local livestock agents as well as the NSW Market Reporting Service.	The same statistics were used to assess baseline data. Consultations were again held with producers to understand individual stock volumes and both Dairy Australia, the local contacts for dairy companies and local livestock agents, and the Eastern Cattle Market Indicator were used to assess contemporary commodity sale prices.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Agricultural Impacts (Cont'd)		
Changes in Industry sector impacts	Demonstrated that the Applicant had just purchased the Speldon Dairy property and Speldon Partnership had just been offered a range of lease properties where initial soil improvement works were being conducted. The Speldon Partnership had a large dairy herd and milked approximately 500 cows a day for milk production of about 4,000,000 litres per annum. Speldon carried out no beef production.	Records significantly increased production from the Rocky Hill Locality due to an extended period of time where Speldon Partnership has been managing and improving land leased from the Applicant. The significant improvement in soil and thus pasture / fodder within the locality led to an increase in dairy herd numbers with 680 cows milked per day and milk volumes much closer to 5,000,000 litres per annum. Speldon now also conducts a beef cattle operation on land that had previously been targeting beef production and the volumes of production were similar to those recorded in the 2013 assessment. Labour volumes used by Speldon (due to the intensity of dairy production) have increased to date by 2 full time and 5 part time employees, a significant increase.
Beef industry Changes	Assessment of beef production and beef sale values demonstrated very little change from the pricing and production for over a decade as recorded by the ABS.	Although beef production volumes within the locality had not changed markedly, the value of production had actually risen by between 80% and 120% depending on the class and age of stock. The assessment demonstrated that this price increase was the result of a number of factors including: extended drought and shortage of numbers, increased market opportunities and steady demand for existing production at domestic levels. These increases in prices had no real impact on increasing labour volumes due to the small numbers of stock in the region.
Dairy Industry	Dairy production values had been steadily rising for almost half a decade with the baseline price around $0.51 per litre in the locality. Although different suppliers paid different pricing it was agreed that the average return was very close to 51 cents and all calculations were based on that pricing. At the time there were three main milk suppliers operating within the region and supply to them was fluid and changes were occurring in volumes delivered to each supplier. However generally the milk was shared between suppliers despite who may have collected it.	Prices have continued to rise, if only slightly, as the milk supply companies were bidding for the milk to endeavour to retain market share. The price used in the assessment was $0.55 per litre on average over all suppliers. At the time the assessment report was completed it became evident there would be a significant downward shift in Murray Goulburn pricing, however, the assessment had been completed prior to that change materialising. The producers within the locality do not supply to Murray Goulburn.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Agricultural Impacts (Cont'd)		
Agriculture and Agriculture Support sector labour volumes	Labour volumes in Agriculture throughout Australia were in steady decline based on the reduction in labour and a growth in contract services. Much of this was thought to be due to constant rationalisation within the industry. Labour figures for the Gloucester LGA had demonstrated National decline up to the completion of the assessment report. The assessment also demonstrated an existing level of employment in the service sector for agriculture within the region.	The same 2011 ABS Statistics were used to measure on-farm labour as no newer statistics were available. However, a revised survey of the product sales and service sectors showed some changes in labour volumes, for example: 2013 - 38 agricultural support positions; and 2016 - 40.5 positions. The increase in beef production volumes have not led to significant changes in labour volumes and it is expected this relates to the traditional move by producers to retire debt prior to significant increases in capital investments and growth which tend to reflect in increased labour volumes. These changes in labour volumes that reflect increased income levels are however, likely to occur in the future.
Social Impacts		
Health	High level of community concern (particularly near neighbours)	Concerns remain and have increased by some in response to diesel emissions from coal haulage. Aging population and aging health care worker cohort emphasised as a challenge.
Social Infrastructure Capacity	Adequate for population growth	Need to shift the dependency ratio through a major employment catalyst that can attract a young cohort to Gloucester – more important in 2016 following the withdrawal of other resource activity from the area.
Community Sense of Place and Amenity	Visual impacts from closeness of mine to some residents and the town of Gloucester a major concern for Council and some community members.	Visual impact concerns remain however there is also concern about amenity in the Waukivory Valley with the introduction of a haul road. Reduced impact on near neighbours of the formerly proposed coal washery, conveyor and rail load-out facility.
Employment	Benefits to the town and region with the creation of sustainable local employment.	Employment creation more critical in 2016 with the withdrawal of AGL, the slowdown of operations at Stratford and projected closure of Duralie Coal Mine in 2017. Some community activism occurring in 2016 in support of mining as an employment catalyst.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Social Impacts (Cont'd)		
Housing	Critical issue for the area. Concerns expressed about access for the lower end of the market.	Following state trends. Affordability will be an issue although qualitative research indicates current availability at the lower end of the market. Greater emphasis in Council documentation on the need for housing options for the elderly.
Cumulative Impacts	High level of concern for cumulative impacts associated with Rocky Hill, Stratford Extension and AGL operations.	Cumulative impacts are greatly reduced due to factors external to the amended Project including reduction of Yancoal mining activity and withdrawal and AGL and CSG exploration from the area.
Economic Impacts		
Applicable Guidelines	The assessment for the 2013 Project was undertaken in accordance with the following guidelines. • *NSW Government Guidelines for Economic Appraisal* (NSW Treasury, 2007). • *Guideline for economic effects and evaluation in EIA* (NSW Department of Urban Affairs and Planning, 2002). • *Guideline for the use of Cost Benefit Analysis in mining and coal seam gas proposals* (NSW Government, 2012).	The assessment for the amended Project was undertaken in accordance with the following guidelines. • *NSW Government Guidelines for Economic Appraisal* (NSW Treasury, 2007). • *Guidelines for the economic assessment of mining and coal seam gas proposals* (NSW Government, 2015a).
Assessment method	Cost Benefit Analysis Economic Impact Analysis using Computable General Equilibrium Modelling	Cost Benefit Analysis Local Area Analysis
Changes to Benefits and Costs (Net Present Value)		
Capital expenditure	$119 million	$81.4 million due to the use of existing capital assets located at the Stratford Mining Complex.
Carbon emissions	$6.7 million	$9.7 million largely due to the use of a higher carbon price and the inclusion of scope 2 emissions in the economic analysis.
Particulate matter	$0.2 million	$0.14 million as impacts are modelled to be lower.
Noise	$0.2 million	$0.002 million as impacts are modelled to be lower.

Table A1.2 (Cont'd)
Key Differences between the Environmental Assessment for the 2013 Project and Amended Project

Project Component	2013 Project	Amended Project
Economic Impacts (Cont'd)		
Royalties	$84 million	$63 million due to a reduction in forecast coal prices.
Rural Amenity and Culture	Predicted to cost the community $8.0 million based principally on estimates of social dislocation costs.	No longer required for assessment under relevant guidelines and therefore not valued. However, this cost is predicted to decrease as the social dislocation costs are no longer an impact.
Flow-on or Multiplier Effects	Incorporated into assessment including a prediction that NSW Gross State Product (GSP) would increase by $662 million as a result of the 2013 Project.	No longer required for assessment under relevant guidelines and therefore not included in the economic assessment. For comparative purposes the ratio of Revenue to NSW GSP has been used to estimate flow on effects to GSP. The flow on increase in NSW GSP as a result of the amended Project is estimated at $502 million. The decreased value relates to changes in capital expenditure, coal prices and production quantities.