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15 May 2019

The Secretary
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

ATTN: Lauren Evans

Mount Owen Continued Operations Project Application Modification 2 (No. SSD 5850 MOD 2) Response to Submissions – request for additional information

Dear Lauren,

The attached information is provided in response to the DPE request on 21 December 2018 and 15 and 22 February 2019 (via email) for further information on the Statement of Environmental Effects (SEE) and in relation to the Response to Submissions (RTS) (2018).

In addition, we note the Draft Rehabilitation Strategy submitted with the SEE (**Appendix 16**), has been subject to further revision as requested by DPE on 25 January 2019, updates included:

- Detailed review of the Rehabilitation Strategy and the MOP to ensure consistency;
- Addition of further information in relation to consultation undertaken with the Resources Regulator and Singleton Council;
- Identification of opportunities for increasing the areas of woodland and habitat connectivity within the rehabilitated landscape;
- Provision of Appendix A, listing the key species to be utilised in the rehabilitation areas. The list should have an appropriate level of diversity and mix of functional groups for each ecological community; and
- Review of the completion criteria to ensure it accurately reflects all the objectives required by the consent and are consistent with the Rehabilitation Management Plan 2017-2021, and are to the maximum extent possible, objectively measurable.

These edits are complete and the revised strategy was submitted to DPE for review and approval on 26 February 2019. The Rehabilitation Strategy will be subject to further update and review should the Proposed Modification be approved.

Please do not hesitate to contact me should you need any further information or clarification.

Kind regards,

Bradly Snedden
Approvals Manager
Mount Owen Complex

M:0428466820

Attachments:
- Consolidated Response Table 1
- Appendix 1 - RAP Consultation
- Appendix 2 - Updated GHG calculations
- Appendix 3 - Noise Modelling Controls
- Figure 1 – Water Monitoring Locations
- Figure 2 – Site Verification Area
- Revised SEE Figure 3.2

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Table 1 – Mount Owen Continued Operations Modification 2 - Response to Submissions

Mount Owen Continued Operations Modification 2		
DPE – request for further information in relation to SEE.		
Aspect	**DPE Request**	**Response**
Groundwater	In Figure 4-2 of the Groundwater Impact Assessment (and Figure 3.2 of the SEE), why are Integra Underground longwalls marked as forming part of the proposed modification?	The Integra Underground longwalls do not form part of the Proposed Modification. The Proposed Modification is annotated with pink hatching on **Figure 3.2**, the figure has now been amended to remove the pink dotted lines from the Integra Underground longwalls to avoid confusion. The revised version of **Figure 3.2** is attached.
	For comparison purposes, how do the modelled years (Years 1 to 19) in Section 7.1 of the Groundwater Impact Assessment relate to those in Section 3.5.2 of the Jacobs assessment from the EIS?	The modelling results are not directly comparable. As discussed in the groundwater impact assessment (GWIA) and the SEE, the groundwater model has undergone extensive refinement, further calibration and peer review to improve its accuracy including the utilisation of additional geological data, further alluvium definition works and the incorporation of monitoring data from the regional monitoring network. The GWIA for the Proposed Modification included modelling the Approved and Proposed mine plans for the North Pit using the refined and updated model. The predicted impacts associated with the Approved Operations are generally less than those presented in the Jacobs GWIA, as a result of the refinements to the model, however because of the refinements it is not appropriate to directly compare the results. It should also be noted that the groundwater model used by Jacobs included the RERR mining area that was subsequently removed from the original Project further influencing the lack of comparability of the previous and current modelling results. The predicted inflows presented in Section 7.1 of the GWIA for the Proposed Modification provides a direct comparison between the Approved Operations and the Proposed Modification. When comparing the modelling results from the current refined groundwater model, the influence of the Approved Operations compared with the Proposed Modification changes over time, which is due to the differences in the sequence and also the depth of mining across the North Pit associated with the Proposed Modification compared to the Approved Operations.
Biodiversity	Section 3.3.1.2 of the Biodiversity Assessment Report identifies four ecosystem credit species which were recorded within the modification area. However, no further discussion appears to have been provided regarding potential impacts on these species.	No further discussion of the impacts to ecosystem species is made in the Biodiversity Assessment Report as the quantum of impacts to these and other ecosystem credit species are calculated for each associated Biometric Vegetation Type (BVT)/Plant Community Type (PCT). The T_G[1] value for each ecosystem species credit species is built into the overall ecosystem credits calculated by the BioBanking Credit Calculator for the proposed impacts. Additionally, there is no requirement under the Framework for Biodiversity Assessment (FBA) methodology to survey or assess the impacts individually for ecosystem credit species, these species are reliably predicted by habitat surrogates (BVTs/PCTs). It is noted that OEH confirmed in their submission in response to the RTS that the requirements of the Biodiversity Assessment Report for the Proposed Modification had been met and no further information is required. Note: [1] T_G value: the ability of a species to respond to improvement in site value or other habitat improvement at an offset site with management actions. T_G is based on an assessment of effectiveness of management actions, life history characteristics, naturally very rare species, and very poorly known species.
Aboriginal Archaeology	Section 4.5 of the SEE provides an overview of the consultation undertaken with respect to the relocation of the artefact storage facility. Copies of correspondence have not been included in Appendix 14 and it is unclear whether Glencore's proposed response has satisfactorily addressed concerns expressed by the Working Group/RAPs.	As discussed in Section 4.5 of the SEE a letter was issued to RAPs and Knowledge Holder Groups requesting feedback specifically in relation to the proposal to store artefacts from the Mount Owen Complex at a central facility at the Wollombi Brook VCA. Copies of the letters issued to RAPs and Knowledge Holder Groups are attached as Appendix 1. Of the more than 50 letters distributed only four responses were received. Two of these did not raise concerns with the facility. The remaining two responses listed security of the facility, access to the facility and questions in relation to who should be consulted and who has decision-making authority in relation to heritage and how it should be managed in the responses. No further written correspondence was issued in relation to these responses. As discussed in the SEE it was intended that these issues would be considered through the development of the Plan of Management by Bulga Coal for the facility, in consultation with the RAPs and Knowledge Holder Groups. Since the SEE was submitted, the facility has been discussed at the Bulga Coal Annual RAP meeting on 5 December 2018. The main outstanding concern from the RAPs in relation to the facility relate to security and the ongoing management of the facility. The key actions from the annual meeting include: 1) Bulga Coal will hold quarterly meetings to provide updates on the progress of the facility 2) A draft management and security plan for the facility will be prepared and provided at the next quarterly meeting for review and comment 3) Include the Reconciliation Action Committee and the Aboriginal Advisory Committee and any other relevant organisations in the broader consultation list for the facility. Design and construction of the storage facility is planned to commence during 2019 which will be managed by Bulga Coal. Consultation in relation to the design and management of the facility will be ongoing to address the concerns raised by the Aboriginal community.

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Aspect	DPE Request	Response
Greenhouse Gas and Energy	The proposed modification would represent a substantial increase in greenhouse gas emissions over the life of the mine. The Department also notes that issues of sustainability were a key source of concern in the community submissions. Please provide further discussion and justification for this increase, having regard to national policy objectives.	The greenhouse gas emissions associated with the Proposed Modification are assessed across a range of scales (project, national, global) as greenhouse gas emissions are highly mobile and have a disperse impact. As Australian greenhouse gas policy is coordinated and enforced at a national level, the Greenhouse Gas and Energy Assessment (GHGEA) focusses on the impact at a national scale. The GHGEA completed for the Approved Operations used a Method 2 fugitive emissions factor (0.037 t CO2-e / ROM t) based on data developed from gas drilling and testing from within the approved mining area. The GHGEA completed for the Proposed Modification, and submitted with the SEE, used the default NSW Method 1 fugitive emissions factor (0.054 t CO2-e / ROM t), as gas survey data of the proposed mining area was not available at the time of the assessment. At a project scale, the greenhouse gas emission forecast presented in the SEE did indicate that the Proposed Modification would represent a substantial increase in Scope 1 greenhouse gas emissions (an increase of approximately 53% above the Approved Operations). This substantial increase was driven by a 38% increase in coal recovered and the use of a very conservative fugitive emission factor (the default Method 1emission factor). The default Method 1 emission factor was 46% higher than the Method 2 emission factor used for the Approved Operations assessment. Since the SEE for the Proposed Modification was submitted, Mount Owen has completed an NGER compliant gas survey of the proposed mining area and developed data suitable for forecasting fugitive emissions using a Method 2 methodology. On this basis, an updated GHGEA has been completed for the Proposed Modification using a Method 2 fugitive emissions factor, and updated Scope 2 and 3 emissions factors (NGA Factors 2018 (DEE 2018)). The updated GHGEA for the Proposed Modification uses a fugitive emissions factor of 0.0095 t CO2-e / ROM t, which is substantially lower (46%) than the default emission factor used for the SEE assessment. The Mount Owen gas reservoir model forecasts relatively low levels of fugitive emissions, as a large proportion (approximately 75%) of coal resources are recovered from a shallow low gas zone, which has a default emission factor of 0.00023 t CO2-e / ROM t. The updated greenhouse gas forecast emissions are presented in **Table 1** with a direct comparison to the emissions presented as part of the SEE for the Proposed Modification, refer to **Appendix 2** for detailed calculations. A comparison to the Approved Operations greenhouse gas forecast emission is provided in **Table 2**. **Table 1 – Summary of the greenhouse gas emissions associated with the Proposed Modification (original calculations vs updated calculations) and % change**

Scope	Source	Source totals (t CO2-e)		Scope totals (t CO2-e)		
		Proposed Modification SEE GHG forecast	Proposed Modification updated GHG forecast	GHG forecast – presented in SEE	GHG forecast - updated assessment	
				Total		%change
Scope 1 (Direct)	Diesel use	623,000	623,000	2,513,000	956,000	-33
	Fugitive emissions	1,890,000^	333,000^^			
Scope 2 (Indirect)	Electricity	310,000	307,000	310,000	307,000	-1
Scope 3 (Indirect)	Product use	47,944,000	47,944,000	50,343,000	50,336,000	0
	Associated with energy extraction and distribution	77,000	70,000			
	Product transport	2,313,000	2,313,000			
	Materials transport	9,000	9,000			
Total GHG Emissions for the Approved Operations and Proposed Modification				53,166,000	51,599,000	-1

^ Based on Method 1 fugitive emission factor

^^ Based on Method 2 gas survey fugitive emission factor

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Table 2 Comparison – Approved Operations vs Proposed Modification (SEE and updated GHG forecast)

Scope	Source	Scope totals (t CO2-e)				
		Approved Operations	Proposed Modification SEE GHG forecast		Proposed Modification updated GHG forecast	
			Total	% increase from Approved Operations	Total	% increase from Approved Operations
Scope 1 (Direct)	Diesel use	4,659,875	2,513,000^	~53	956,000^^	~20
	Fugitive emissions					
Scope 2 (Indirect)	Electricity	810,223	310,000	~38	307,000	~37
Scope 3 (Indirect)	Product use	122,365,222	50,343,000	~41	50,336,000	~41
	Associated with energy extraction and distribution					
	Product transport					
	Materials transport					
Total GHG Emissions for the Approved Operations and Proposed Modification		127,835,320	53,166,000	~41	51,599,000	~40

^ Based on Method 1 fugitive emission factor
^^ Based on Method 2 gas survey fugitive emission factor

The updated calculations indicate the Proposed Modification may increase Scope 1 greenhouse gas emissions by ~20% (above the Approved Operations), and the Proposed Modification could generate an annual increase of approximately 51,000 t CO_2-e (reduced from 133,000 t CO_2-e presented in the SEE), over the Approved Operations, for up to 19 years. The updated assessment forecasts lower Scope 2 and 3 emissions when compared to the emission estimates completed for the SEE. The decrease is driven by lower emission factors associated with electricity use.

The updated calculations present significantly lower Scope 1 emissions associated with the Proposed Modification, than the previous conservative assessment presented in the SEE. The updated greenhouse gas inventory associated with the Proposed Modification is still dominated by Scope 3 emissions, and consistent with the Approved Operations, approximately 97% of the greenhouse gas emissions occur downstream from the mining operation. The updated assessment found that only 3% of total greenhouse gas emissions are likely to be associated with on-site energy use and fugitive emissions (Scope 1 and 2).

At a national scale, the Proposed Modification represents an increase in Scope 1 emissions directly associated with the proposed extraction of the additional 35 Mt ROM coal.

Australia signed the Paris Agreement on 22 April 2016, and ratified it on 6 November 2016. Australia is not bound under international law to achieve the emission reduction target in its Nationally Determined Contribution (NDC), although it is to be observed that countries are likely to face international pressure if they fail to meet NDC targets.

Australia has obligations under the Paris Agreement to:

(a) prepare, communicate and maintain an NDC that it intends to achieve (Article 4(2));

(b) pursue domestic mitigation measures, with the aim of achieving the objectives of its NDC (Article 4(2));

(c) communicate an NDC every 5 years (Article 4(3), (9)); and

(d) account for its NDC and, in the process, ensure the avoidance of double counting in accordance with the methodologies and common metrics assessed by the IPCC and adopted by the Katowice Climate Package (Article 4(13)).

With respect to the specifics of Australia's NDC, it is noted that Australia's NDC communicates an unconditional economy-wide target to reduce greenhouse gas emissions by 26-28% below 2005 levels by 2030.

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Australia's NDC is summarised in the table below:

Emissions reduction target	Economy-wide target to reduce greenhouse gas emissions by 26 to 28 % below 2005 levels by 2030
Coverage	Economy-wide
Scope	- Energy - Industrial processes and product use - Agriculture - Land-use, land-use change and forestry - Waste
Gases	CO2, CH4, N2O, HFCs, PFCs, SF6, NF3

The policy document supporting Australia's NDC communicates that Australia will achieve its 2030 target through the direct action policy suite. The key component of the direct action policy suite is the Emissions Reduction Fund (ERF), which is complemented by the Safeguard Mechanism, the Renewable Energy Target (which requires 33,000GWh of electricity generation (or approximately 23.5% of total generation) to be produced from renewable resources by 2020), improvements in energy efficiency under the National Energy Productivity Plan, phasing out of synthetic greenhouse gases and direct support for investment in low emissions technologies and practices.

For the Proposed Modification, the most relevant mechanisms in the suite of policy measures are:

- the ERF; and
- the Safeguard Mechanism.

First, the ERF is a $2.55bn fund which purchases least cost emission reductions and abatement through a Commonwealth government procurement process, which includes reverse auctions. It is underpinned by the Carbon Credits (Carbon Farming) Act 2011 (CFI Act) which creates a legislative framework for the development of offset projects and the creation of Australian Carbon Credit Units (ACCUs). The CFI Act was initially enacted to support activities in the land sector but has been amended to now support a wider range of projects related to energy, transport and industry.

Separate from, but related to the ERF, it should be acknowledged that the Australian Government recently announced the Climate Solutions Package, which is a $3.5 billion plan to deliver Australia's 2030 emissions reduction target. As part of the package, a Climate Solutions Fund has been established to continue the work of the ERF with an additional $2 billion investment over 10 years. Approximately $200 million per year over ten years is expected to be allocated to abatement purchases through the ERF. The Climate Solutions Fund is also designed to be a fund that will partner with businesses, local communities and farmers in emissions reduction programs. How this will affect the current auction approach preferred by the fund is unclear. The Package, and the fund specifically, has been promoted as a key policy to contribute to meeting the national 26% emissions reduction target by 2030.

Secondly, the Safeguard Mechanism, established under Part 3H of the National Greenhouse and Energy Reporting Act 2007 (NGER Act), aims to ensure that emission reductions purchased by the Government under the ERF are not offset by increases in emissions in other areas of the economy.

The Safeguard Mechanism sets a baseline on emissions for facilities that emit over 100,000 tonnes CO_2-e per year. When the Safeguard Mechanism was implemented, baselines were set for existing facilities using data reported under the NGER Act. For most facilities, baselines were the highest level of reported emissions for a facility over the historical period 2009-10 to 2013-4. These baselines can be adjusted to accommodate economic growth, natural resource variability and other circumstances where historical baselines will not represent future business-as-usual emissions. Up to 2020, baselines for new

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		facilities will be based on an audited emissions forecast provided by the facility operator, with a reconciliation of the estimate against the actual performance of the facility at the end of the forecast period. For new facilities completed after 1 July 2020 (or existing facilities with new investments), baselines will be set to encourage facilities to achieve and maintain best practice. If a facility exceeds its baseline, it is nominally required to surrender a number of ACCUs equivalent to the exceedance to the Clean Energy Regulator (CER). It is also noted that there are other mechanisms by which a facility can manage baseline exceedance, including applying for multi-year monitoring periods and exemption for exceptional circumstances (i.e. natural disasters or criminal activity unrelated to the liable entity). For example, if a facility has a FY2016/17 baseline of 1,000,000 tonnes CO2-e and reported emissions of 1,500,000, the company with operational control of that facility would have to surrender 500,000 ACCUs to comply with its baseline, or be liable to the penalty under section 22XF of the NGER Act. In its first year of operation (FY2016/17), 203 facilities were covered by the Safeguard Mechanism with combined emissions of 131.3 million tonnes of CO2-e. Sixteen facilities exceeded their emissions limit and purchased and retired a total of 448,097 ACCUs to clear their liabilities. There has been no exceedance of the emission limits at the Mount Owen Complex. The Safeguard Mechanism was reviewed in 2017 and 2018. In March 2019, the National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment Rule (No 1) 2019 commenced. On its website, the Department of Environment and Energy has indicated that the amendments: • bring baselines up-to-date by transitioning all facilities to calculated baselines over 2018-19 and 2019-20; • simplify calculated baseline applications by giving businesses the option to use Government-determined prescribed production variables and default emissions intensity values for calculating baselines; and • update baselines annually for actual production where facilities use eligible production variables, so they continually reflect facility circumstances. The existing operating Mount Owen mine has been allocated a reported baseline which corresponds to its highest level of emissions during the period 2009-10 to 2013-14 (534,146.00 tonnes of CO2-e). Mount Owen will continue to operate the Mount Owen Complex in accordance with the Safeguard Mechanism, should the Proposed Modification be approved, a review of the facility boundaries and operational control of the Mount Owen Complex will be undertaken which may result in new baselines being allocated. Those baselines are likely to be determined on a calculated emissions baseline approach, under which baselines are set using an audited forecast of emissions over the three-year period that the baseline is to apply. Under this approach, the baseline is calculated by multiplying the high-point of estimated annual production over the period by the estimated emissions-intensity of that production (tCO2-e per unit of production). The Proposed Modification in isolation is unlikely to limit Australia achieving its national mitigation targets. Small fluctuations in the performance of the electricity generation and transport sectors offer a far greater potential to influence the achievement of national targets than single facilities. Additionally, almost all of the Scope 3 emissions associated with the Proposed Modification are generated by the burning or combustion of coal by the end-user of the coal. As the coal from the Proposed Modification is planned to be exported, the generation of all Scope 3 emissions will occur outside of Australia. In this regard, the Scope 3 emissions of the Proposed Modification would count as Scope 1 emissions in each of the countries to which the coal is exported and, if Australia were to count the Scope 3 emissions from the Proposed Modification in calculating its GHG emissions, this would result in an unacceptable double counting of GHG emissions. We note that a detailed response to the issues of sustainability raised by the community and national policy objectives in relation to climate change has been provided in Section 6.8 of the Response to Submissions report. Glencore acknowledges the goals committed to under the Paris Agreement and the global ambition to transition to a low carbon economy. Glencore is committed to managing the future global coal production capacity broadly to current levels under a coal production cap (to around 150 Mt per annum). All existing mining operations and projects currently in the planning and assessment phase (including the Proposed Modification) are included in the coal production cap. Glencore recognises the importance of continued reductions of greenhouse gas emissions and are developing new, longer-term targets based on policy and technological developments that support the goals of the Paris Agreement.
	The EIS and MOD 2 SEE appear to use different assumptions regarding the proportion of thermal and coking coal – does this affect Scope 3 emissions predictions?	The Proposed Modification will mine deeper, higher quality coal seams that result in the production of a higher proportion of semi-soft (coking) coal (used in steel manufacture) than the Approved Operations. Scope 3 emissions associated with the Approved Operations were calculated on the basis that the Approved Operations would produce 7% coking coal. Scope 3 emissions for the Proposed Modification have been calculated on the basis that the project would produce 17% coking coal as a result of mining these deeper, higher quality coal seams. Coking coal has a higher product use emission factor than thermal coal. Increasing the percentage of coking coal increases Scope 3

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		emissions associated with product use.
	The EIS also included an assessment of greenhouse gas emissions for mine closure and rehabilitation – please confirm whether the proposed modification would change those original predictions.	The GHGEA for the Proposed Modification assumed the Proposed Modification would not change the final effort required to close and rehabilitate the Mount Owen Mine. Therefore, emissions associated with closure and rehabilitation were deliberately excluded from the assessment. The GHGEA models life of mine emissions based on annual diesel use forecasts, which include the progressive rehabilitation of the mine site. The Proposed Modification extends the life of the operations, which moves the final rehabilitation effort to the end of the proposed mine life, rather than the end of the approved mine life. However, the energy use demand for the final rehabilitation effort for the Proposed Modification is expected to be similar to the Approved Operations.
Surface Water	There seem to be some inconsistencies between Tables 5.1 and 5.4 of the Surface Water Impact Assessment with respect to catchment sizes for Main Creek. Please clarify.	The catchment areas are correctly shown in **Table 5.4**. The numbers have been transposed in Table 5.1. The Approved Operations Final Landform Catchment is 2,530 ha and the Proposed Modification year 2 is 2,390.
	The comparative site water balance shows a significant increase in evaporation losses between the approved and proposed operations, ie from 528 ML to 1,306 ML in Year 2 (see Tables 4.1 and 4.2 of the Surface Water Impact Assessment). What is the reason for that?	The water balance for the Approved Operations presented in **Table 4.1** does not account for all sources of evaporation from the site (i.e. from all water storages). The water balance for the Proposed Modification includes all evaporation sources and is consistent with the evaporation estimates that were modelled for the Mount Owen Continued Operations Project.
	Is Glencore proposing to implement all of the recommendations of the Geochemical Assessment, including the additional monitoring locations/frequency/parameters? If so, could we please have a figure which shows where those additional monitoring sites will be located (ie ECD2, West Pit decant, North Pit dewatering)?	As discussed in Section 6.5.5 of the SEE, the Mount Owen Surface Water Management and Monitoring Plan (SWMMP) will be updated to include water quality monitoring provisions to monitor for ARD effects, in accordance with the recommendations from the Geochemistry Assessment. Monitoring will be undertaken at the ECD dam (see **Figure 1**), a sample will be taken directly from the ECD dam. West Pit Decant and North Pit Dewatering will also be sampled at the ECD dam at the pipe outlets prior to the water entering the ECD dam.
Noise	While the RTS provides further justification for the noise assessment methodology, it does not provide any further explanation regarding the optimised scenarios. Specifically, it is still unclear which control options were applied in order to achieve compliance with the noise criteria. Page 37 of the RTS states: 'It should also be noted that the maximum level of control required to meet the existing noise criteria at each of the receiver locations…. is only required for the worst case meteorological conditions that are applicable according to the definitions in Appendix 4…' It is not clear what the 'maximum level of control' entailed under each scenario. The Department recognises that Glencore requires flexibility to select the most appropriate combination of noise controls at any one time, based on conditions and operational demands. However, the assessment should be transparent about how compliance with the noise criteria was achieved under each of the modelled scenarios.	A detailed response to the information requested is provided in **Appendix 3**.
	Receiver 133 has been assessed as vacant land. The original EIS for the project indicates that there is (or was) a residence at this location. Please clarify.	Receiver location 133 was incorrectly identified as a residence in the original EIS, there are some vacant outbuildings located on the property however there is no residence.
Economics	In Table 3.1 of Appendix 18, how was the 105.8 Mt figure calculated (ie the total proposed tonnage for the Project Case)? I don't think this is necessarily key to the Economic Impact Assessment, but I'd just like to be clear on this for the purposes of our assessment more broadly.	As detailed in Table 3.1 of Appendix 18: Total approved tonnage to 2030 is 98 Mt ROM coal (includes Mount Owen coal approved before approval of SSD-5850 and additional tonnes under SSD-5850) Minus approved ROM coal tonnage 2016-2017 of 18Mt and 2018 8.6 Mt (Total 26.6 Mt) (Mount Owen coal approved before SSD-5850) Total 71.4 Mt ROM coal Plus proposed approximately 34.4 (rounded to 35) = 105.8 Mt ROM coal
Site Verification Certificate	DPE identified an area within the Approved Disturbance Area which is: • part of the approved disturbance area for SSD 5850, but is not currently approved for mining (it's outside the approved pit footprint); and • located outside of the surface mining lease area.	The area identified was within the exclusion area associated with SVC 7274 for the current SSD-5850 approval (refer to **Figure 2**), as the area was outside the area over which a mining lease was required to be issued to enable the development (as proposed at the time) to be carried out. The area verified under SVC 7274 under the current SSD-5850 approval was the mining area of the proposed mining lease (being the area subject to AL08/MLA512). In determining the verification area applicable to the Proposed Modification (SVC 8624, the same exclusion area utilised for the SVC for the original project and the SSD-5850 verified area (SVC7274) was applied to determine the verification area applicable to the Proposed Modification and therefore the area in

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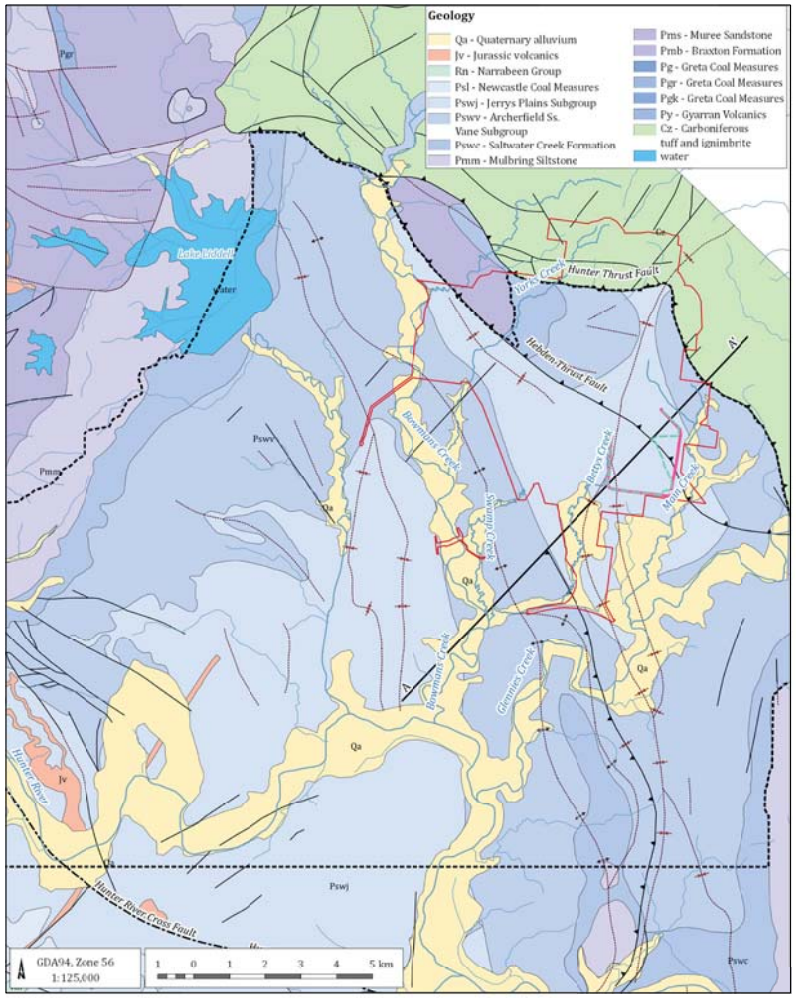
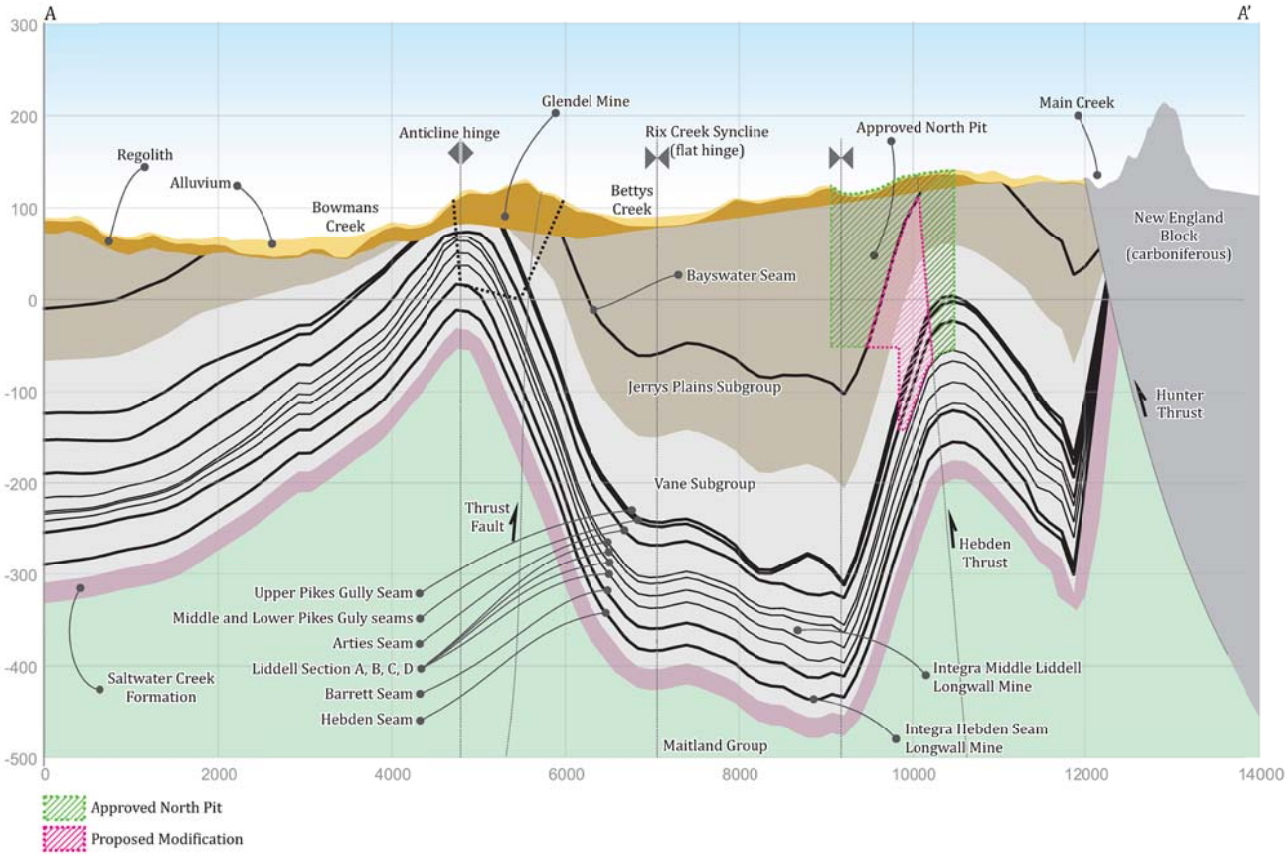
	This area was not covered under the SVC for MOD 2, or the original SVC for SSD 5850. Can you confirm why this area was excluded?	question was inadvertently excluded (refer to **Figure 2**). A mining lease is required over the area identified as part of the Proposed Modification. In order to address this issue, Mount Owen has submitted a SVC application for this area. This is considered to be an administrative issue as the area does not meet the BSAL criteria. The area in question is <20 hectares (approximately 7.4 hectares), with approximately half the area subject to areas >10 % slope and directly adjoins a large area verified as not containing BSAL.





Proposed SSD-5850 Modification consent boundary
Approved Operations pit shell boundary
Proposed Modification pit shell boundary
Model boundary
Alluvium extent
Cross section (A-A')
Thrust fault
Fault
Anticline
Syncline
Fold
Major drainage
Minor drainage

FIGURE 3.2

Regional Geology

Image Source: Glencore (2018), AGE (2018)

Image Source: Glencore (Jul 2018)

0 250 500 750m
1:15 000

FIGURE 1

Additional Water Monitoring

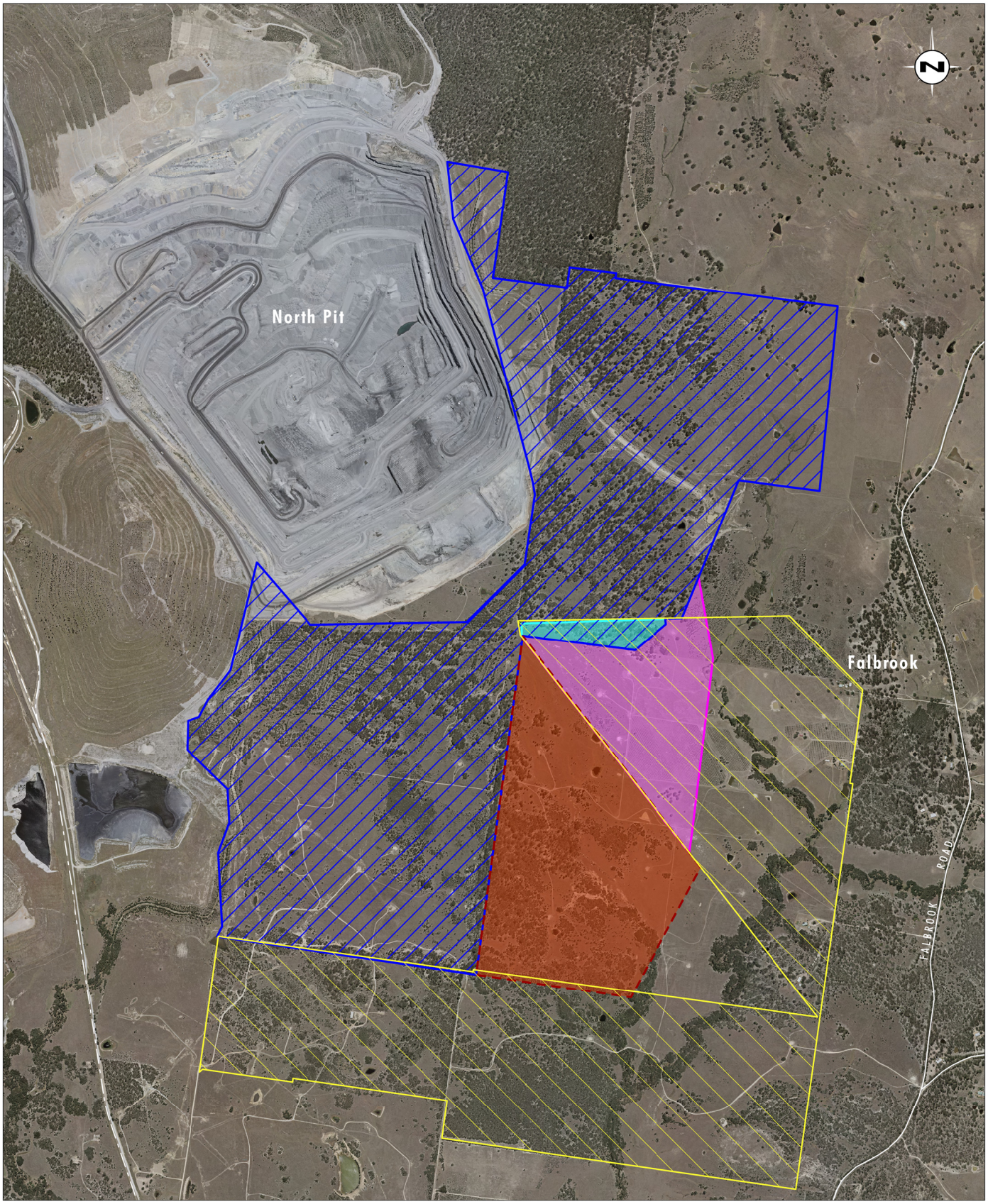


Image Source: Glencore (2017)
Data Source: Glencore (2019)

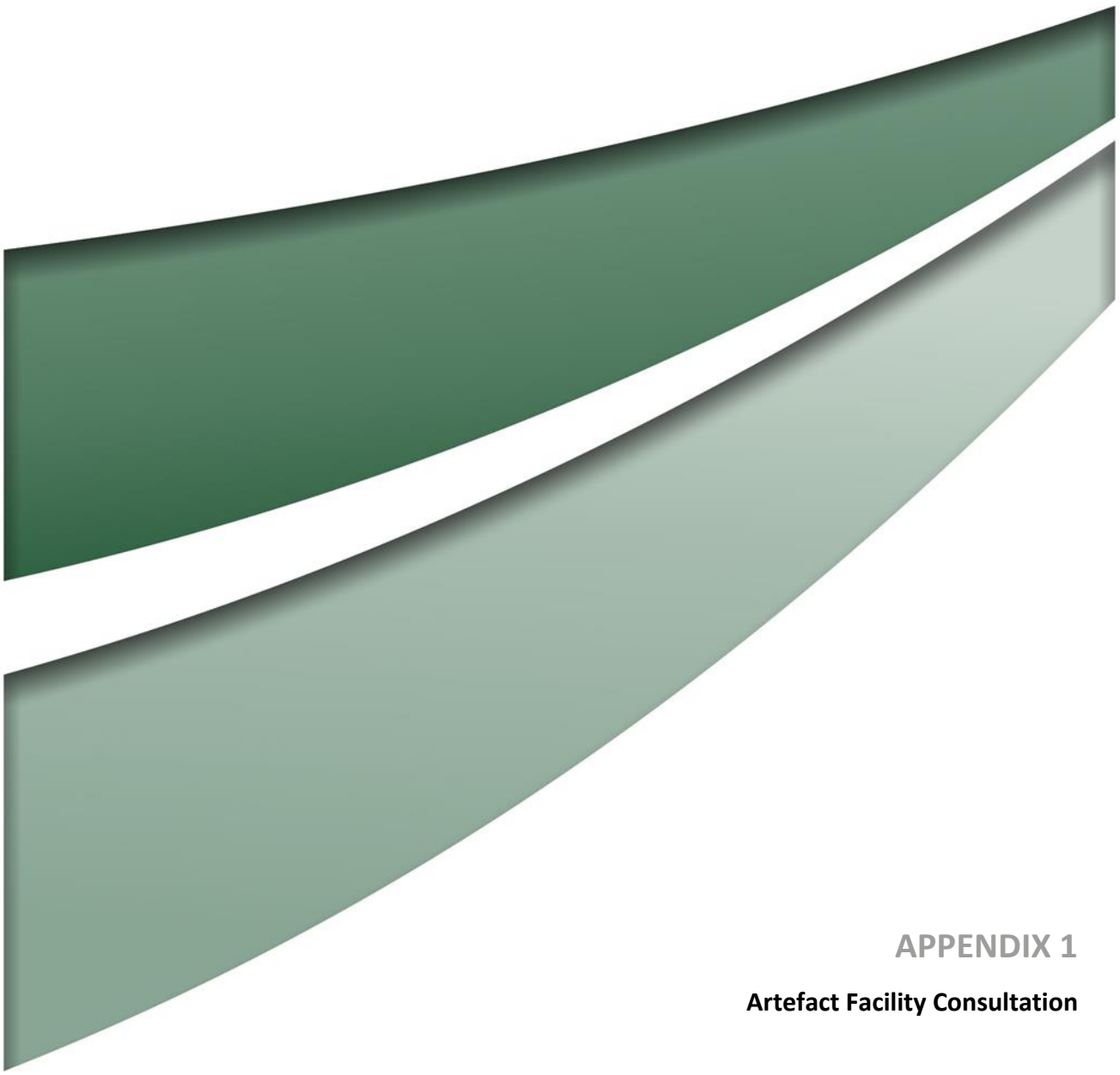
0 0.5 1.0 1.25km
1:25 000

Legend

- SVC 7274 Area
- SVC 8624 Area
- Exclusion Area
- Proposed Verification Application Area (VAA)
- MLA 565

FIGURE 2

Site Verification Review



APPENDIX 1

Artefact Facility Consultation

MT OWEN
OPEN CUT
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21 March 2018

«AddressBlock»

Re: Amendment to consent condition SSD-5850 Mount Owen Continued Operations Project – Artefact Storage Facility

«GreetingLine»

We are contacting as you as a Knowledge Holder for Mount Owen Continued Operations Project. We are seeking your feedback on the following proposed amendment to the current consent conditions of SSD-5850 in relation to the construction of an artefact storage facility at the Mount Owen Complex.

Background

The Statement of Commitments for the Mount Owen Continued Operations Project included a commitment to *construct a suitable fit for purpose artefact storage facility to store cultural heritage artefacts recovered during previous research and salvage programs and for items recovered for the Project, within 2 years of approval for the Project*.

Consent condition No. 34 requires the preparation of an Aboriginal Cultural Heritage Management Plan (ACHMP) for Mount Owen which includes a strategy for the storage of heritage items salvaged on site. This includes both during the operational life of Mount Owen and in the long term, post mining. Following the approval the Mount Owen ACHMP was updated to include the storage of artefacts within the existing Yorks Creek Voluntary Conservation Area (VCA).

Since this time Glencore have been investigating the potential to provide a central artefact storage facility to service the neighbouring Glencore mines in the Hunter Valley. The proposed location is at Bulga Coal's Wollombi Brook VCA (Figure 1). The indicative layout and potential building plans are shown in Figures 2 – 4. The facility will provide for secure storage of artefacts as well as meeting and picnic facilities.

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Proposal

We are currently preparing a Statement of Environmental Effects (SEE) for the Mount Owen Continued Operations Project Modification 2 (Proposed Modification). The Proposed Modification will allow the recovery of an additional 35 million tonnes of run of mine (ROM) coal through a further 46 hectares of disturbance from the mining tenements Glencore obtained through its acquisition of the Integra Underground Mine. This change will also allow the extension of the Mount Owen mine life to 2037 (an additional 6 years). The Proposed Modification also provides an opportunity to seek amendments to other relevant conditions of the existing development consent, such as those related to the management of artefacts recovered at Mount Owen.

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Mt Owen Pty Ltd ABN 83 003 827 361

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These considerations will be included in the Plan of Management for the Wollombi Brook facility. Bulga Coal will continue to consult on the plan. It is anticipated that construction of the facility at Bulga Coal will start this year.

The Proposed Modification will include a request to update consent conditions of SSD-5850. If approved this would then be followed with an update to the Mount Owen ACHMP to provide Care and Control for Mount Owen artefacts at the Wollombi Brook VCA once the building is completed. Note, no further changes are proposed in relation to the Yorks Creek VCA at Mount Owen which will be retained.

If you would like to provide feedback on this proposed consent condition amendment please respond within 28 days of the date of this letter. Alternatively if you would like to discuss or would like further information please do not hesitate to contact me on the details below.

Yours sincerely,

Brad Snedden

Approvals Manager – Mount Owen Complex
02 6520 6820

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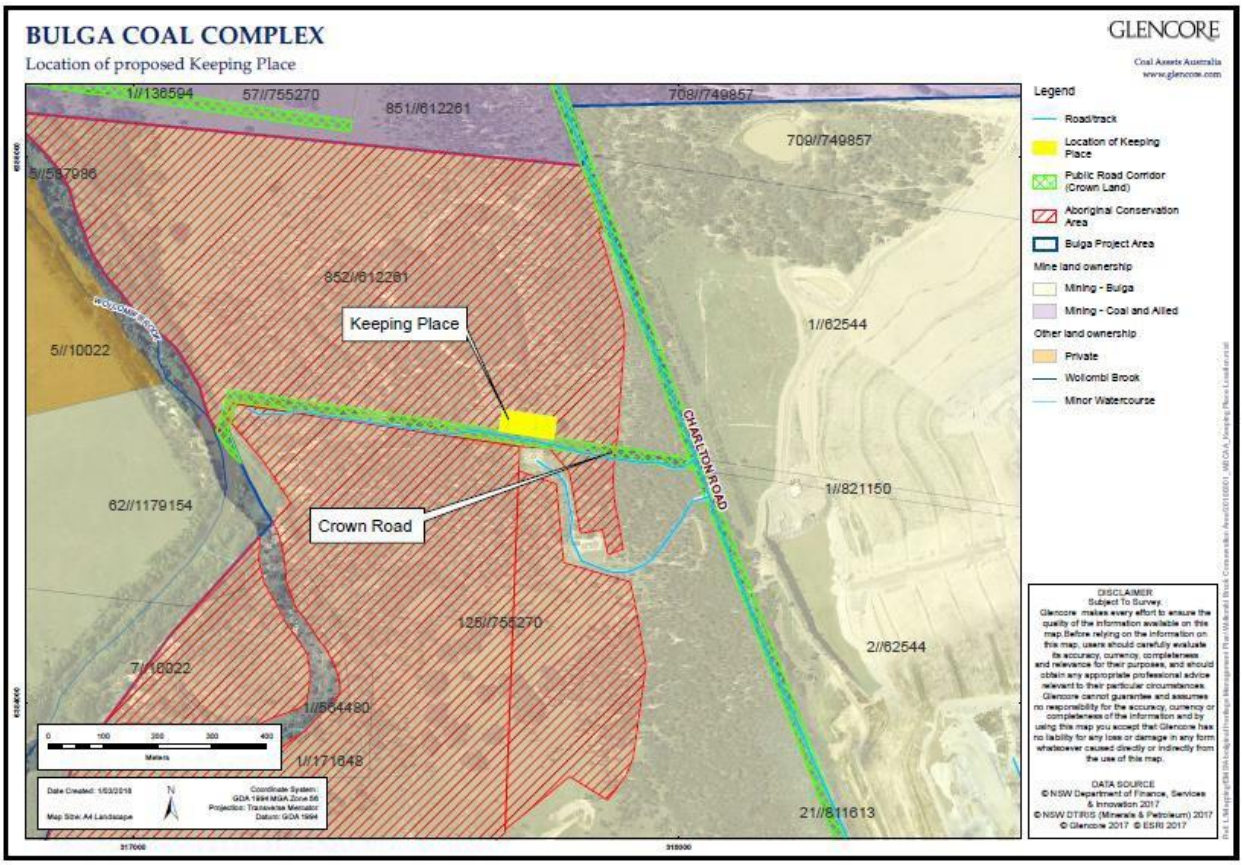

Figure 1. Location of Wollombi Brook VCA

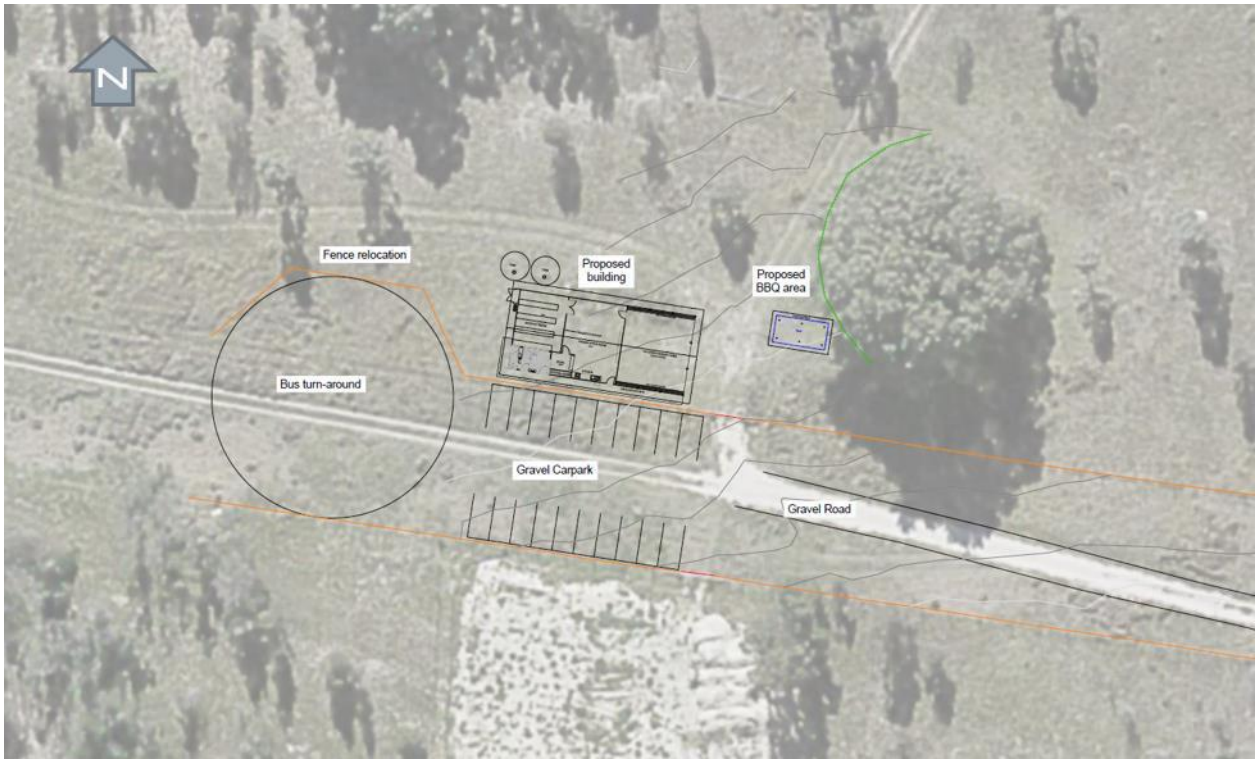

Figure 2. Indicative layout of facility at Wollombi Brook VCA

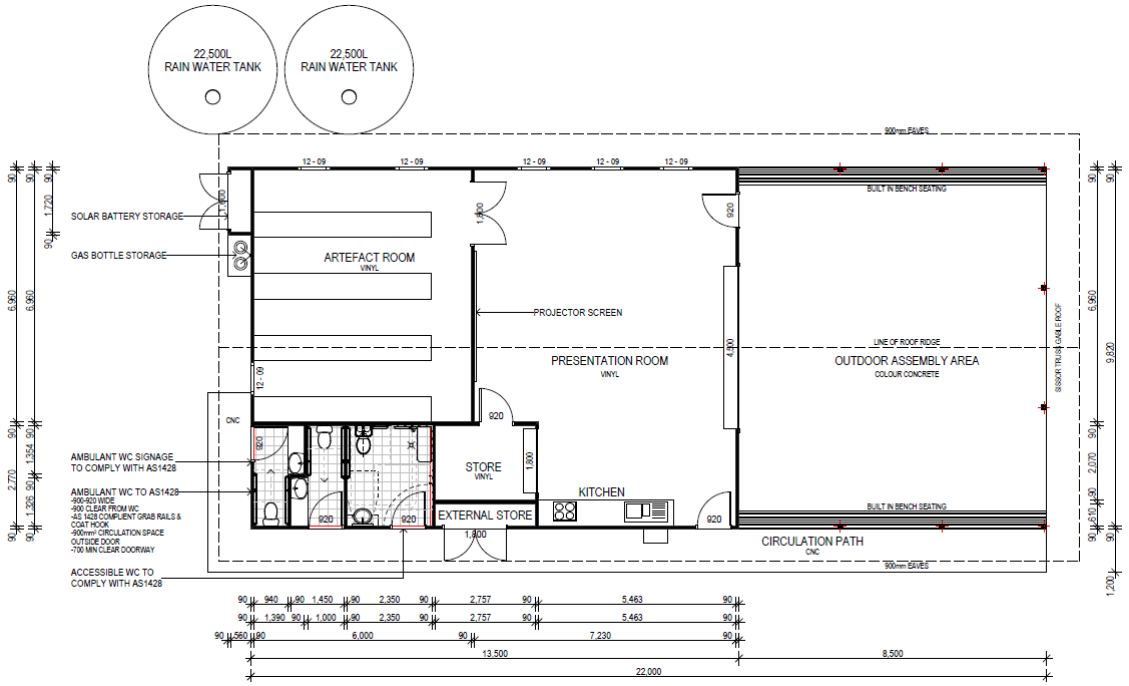

Figure 3. Indicative building plan – layout

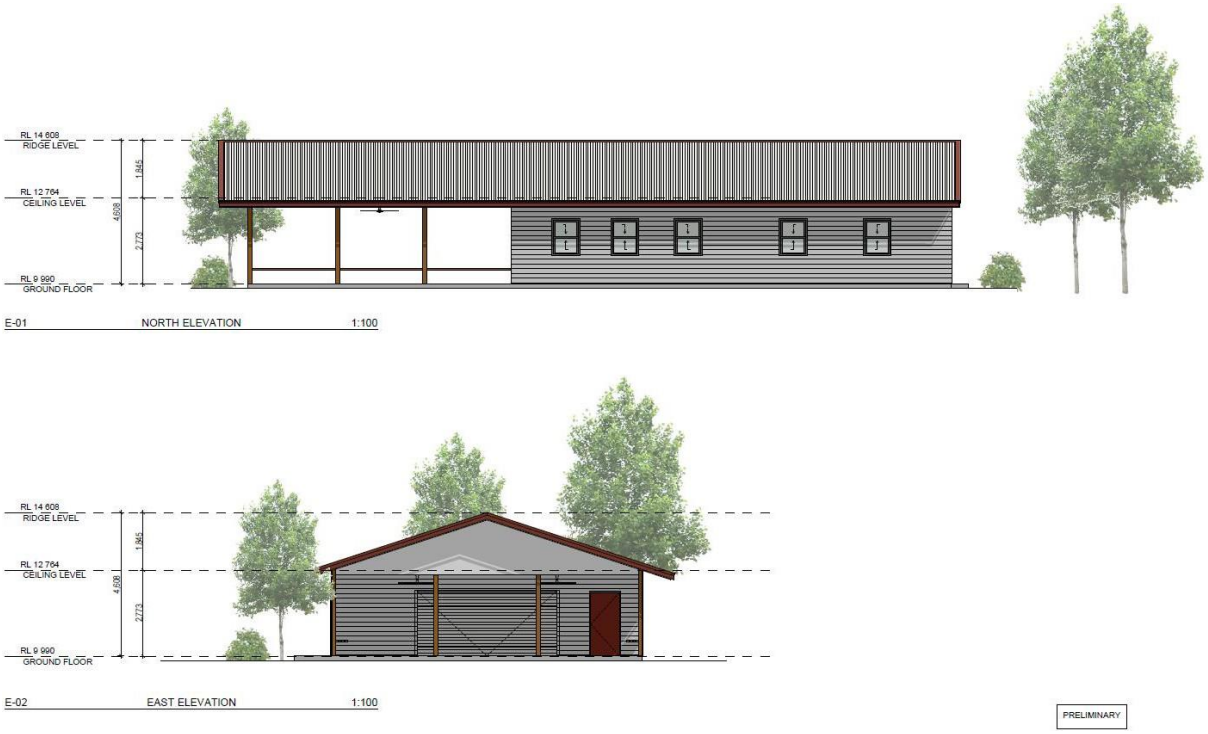

Figure 4. Indicative building plan – east elevation

MT OWEN
OPEN CUT
GLENCORE

21 March 2018

«AddressBlock»

Re: Amendment to consent condition SSD-5850 Mount Owen Continued Operations Project – Artefact Storage Facility

«GreetingLine»

We are contacting as you as a Registered Aboriginal Party for Mount Owen Continued Operations Project. We are seeking your feedback on the following proposed amendment to the current consent conditions of SSD-5850 in relation to the construction of an artefact storage facility at the Mount Owen Complex.

Background

The Statement of Commitments for the Mount Owen Continued Operations Project included a commitment to *construct a suitable fit for purpose artefact storage facility to store cultural heritage artefacts recovered during previous research and salvage programs and for items recovered for the Project, within 2 years of approval for the Project*.

Consent condition No. 34 requires the preparation of an Aboriginal Cultural Heritage Management Plan (ACHMP) for Mount Owen which includes a strategy for the storage of heritage items salvaged on site. This includes both during the operational life of Mount Owen and in the long term, post mining. Following the approval the Mount Owen ACHMP was updated to include the storage of artefacts within the existing Yorks Creek Voluntary Conservation Area (VCA).

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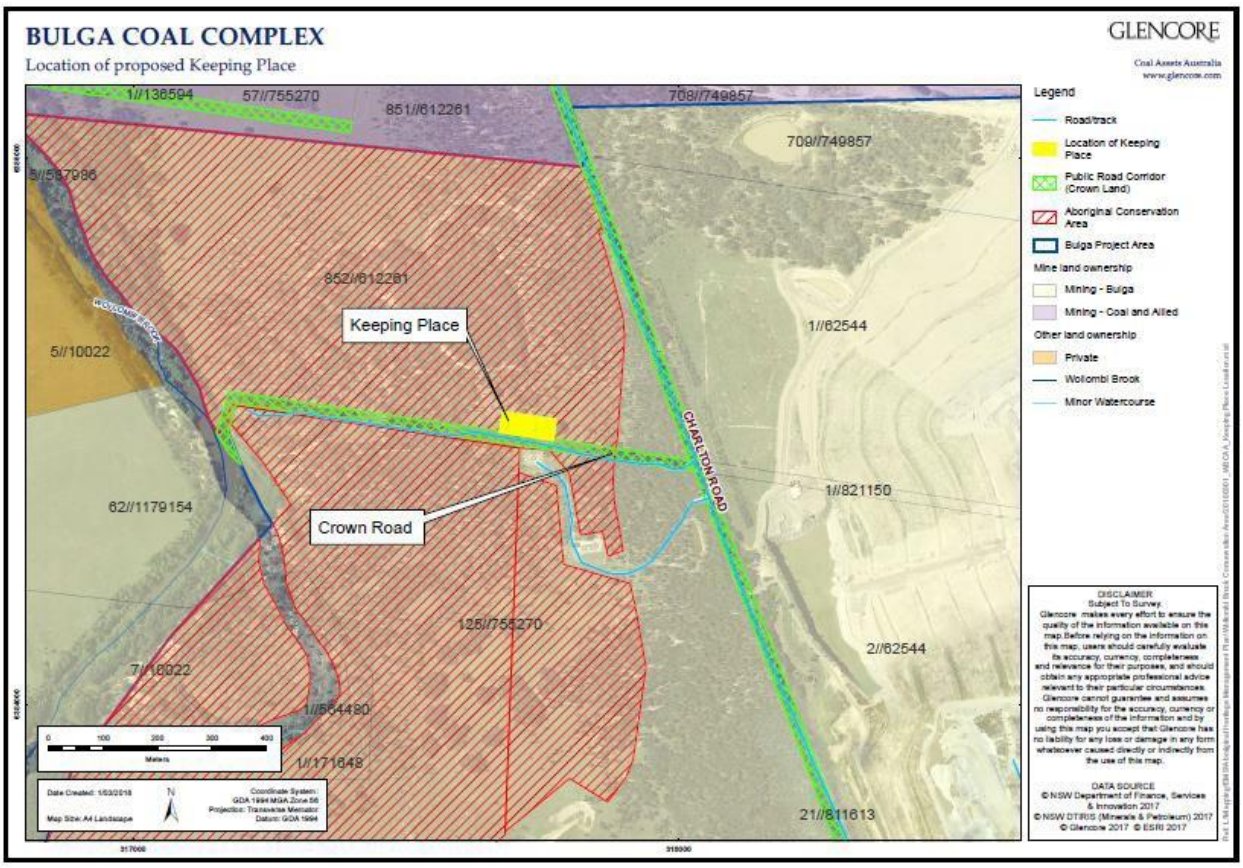

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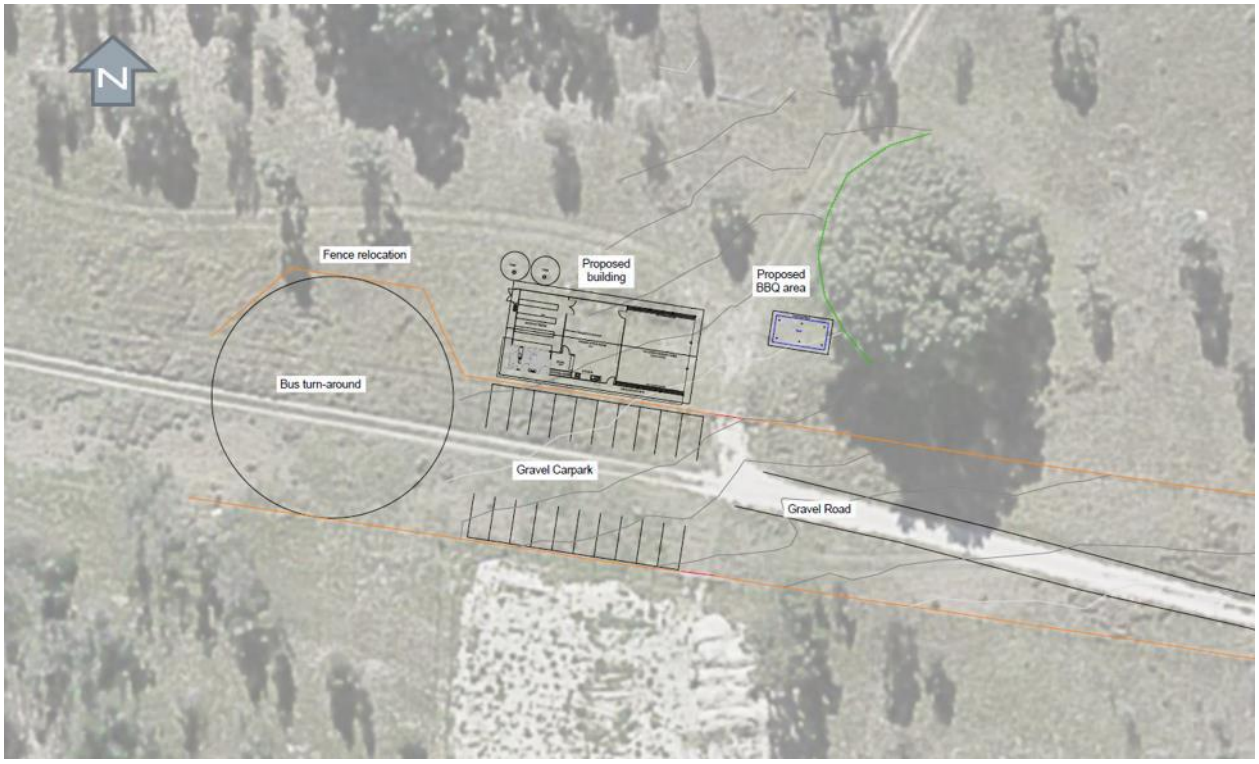

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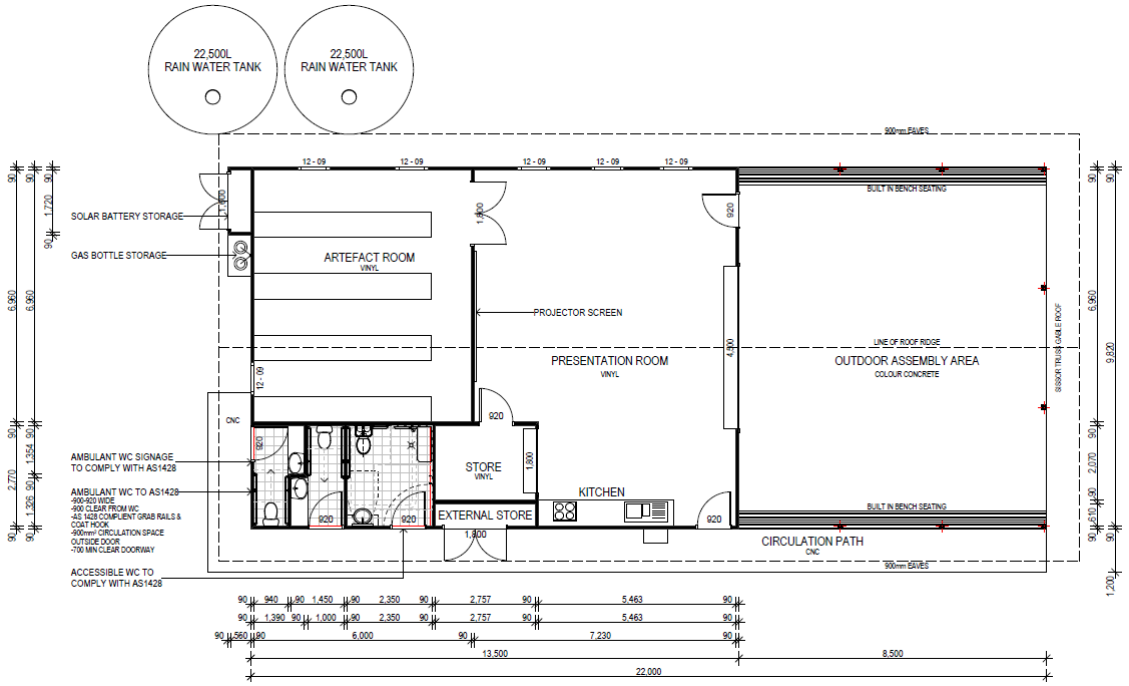

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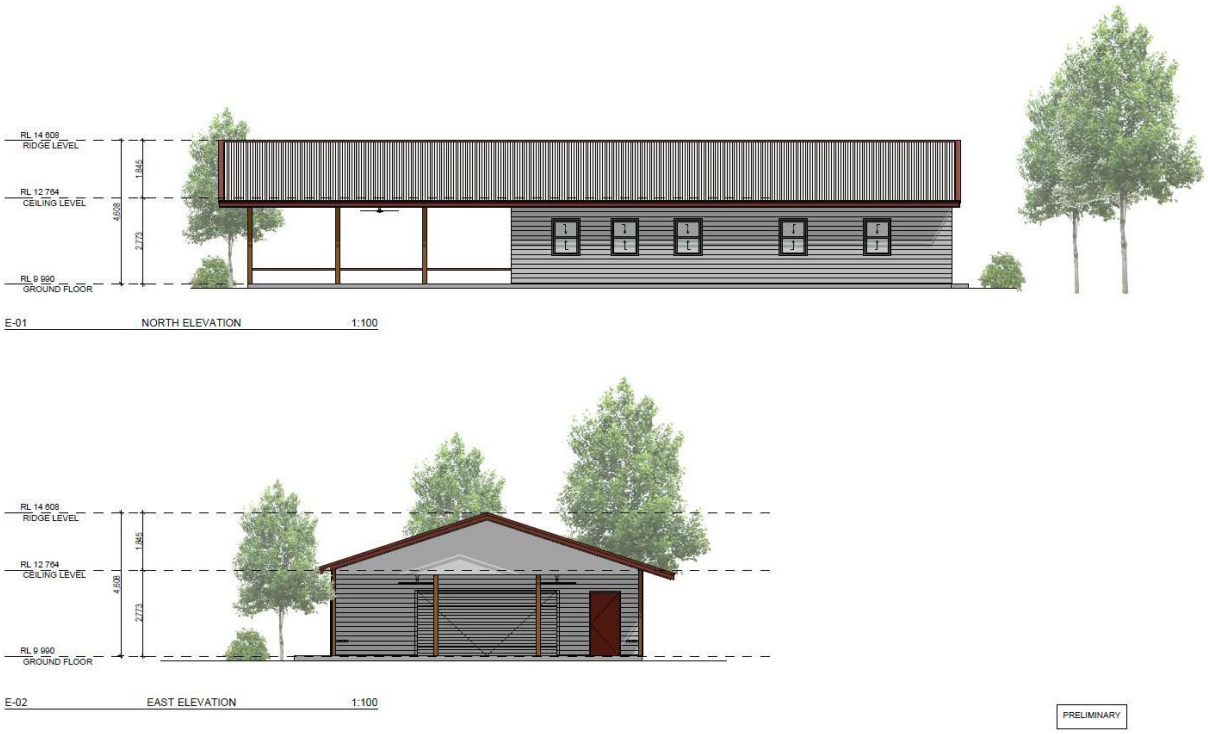
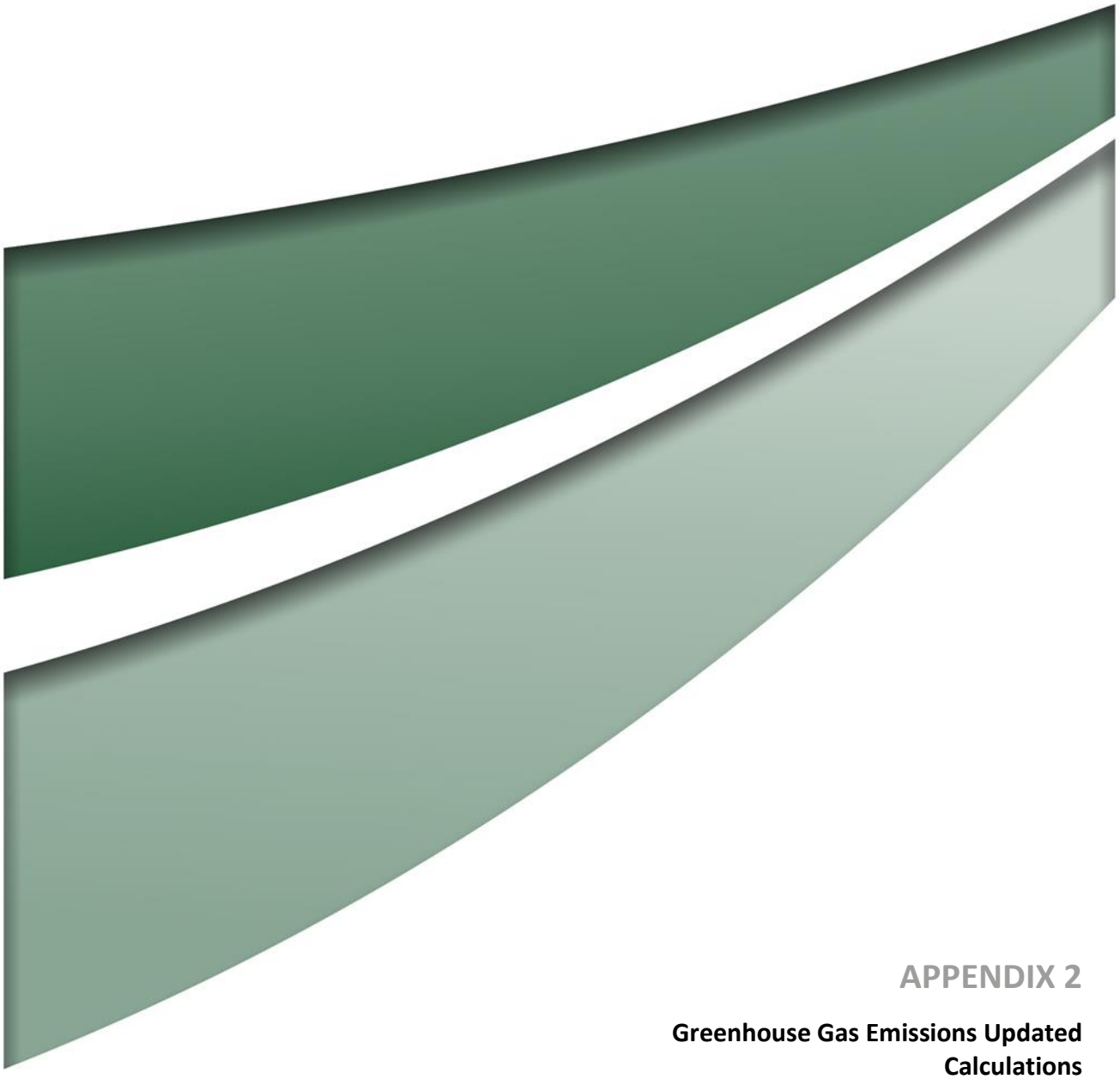


Figure 4. Indicative building plan – east elevation



APPENDIX 2

Greenhouse Gas Emissions Updated Calculations

Appendix 2 – Updated Greenhouse Gas Emission Calculations

Stationary Diesel Use

Activity Data	**Energy Use**		**Emission Factors**		
			CO_2	**CH_4**	**N_20**
kL	GJ/kL	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
229,860	38.6	8,872,596	69.9	0.1	0.2
			t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)			620,194	887	1,775
Total GHG Emissions (t CO_2-e)					**622,856**

Fugitive Emissions

Activity Data	**Energy Use**		**Emission Factors**		
			CO_2	**CH_4**	**N_20**
ROM (t)	-	-	kg CO_2-e/ROM t	kg CO_2-e/ROM t	kg CO_2-e/ROM t
35,000,000	N/A	N/A	N/A	9.5	N/A
			t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)			N/A	332,500	N/A
Total GHG Emissions (t CO_2-e)					**332,500**

Electricity Use

Activity Data	Energy Use	Emission Factors		
		CO_2	**CH_4**	**N_20**
GJ	GJ	kg CO_2-e / GJ	kg CO_2-e / GJ	kg CO_2-e / GJ
1,344,768	1,344,768	228	N/A	N/A
		t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG emissions (t CO_2-e)		306,607	N/A	N/A
Total GHG Emissions (t CO_2-e)				**306,607**

Product Use

Activity Data		Energy Production		Emission Factors		
				CO_2	**CH_4**	**N_20**
Product	Product (t)	GJ/Product t	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Thermal coal	15,913,974	27.0	429,677,298	90	0.03	0.2
Coking coal	3,323,075	30.0	99,692,250	91.8	0.02	0.2
				t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG Emissions (t CO_2-e)				47,822,705	14,884	105,874
Total GHG Emissions (t CO_2-e)						**47,943,463**

Extraction, Production and Distribution of Energy Purchased

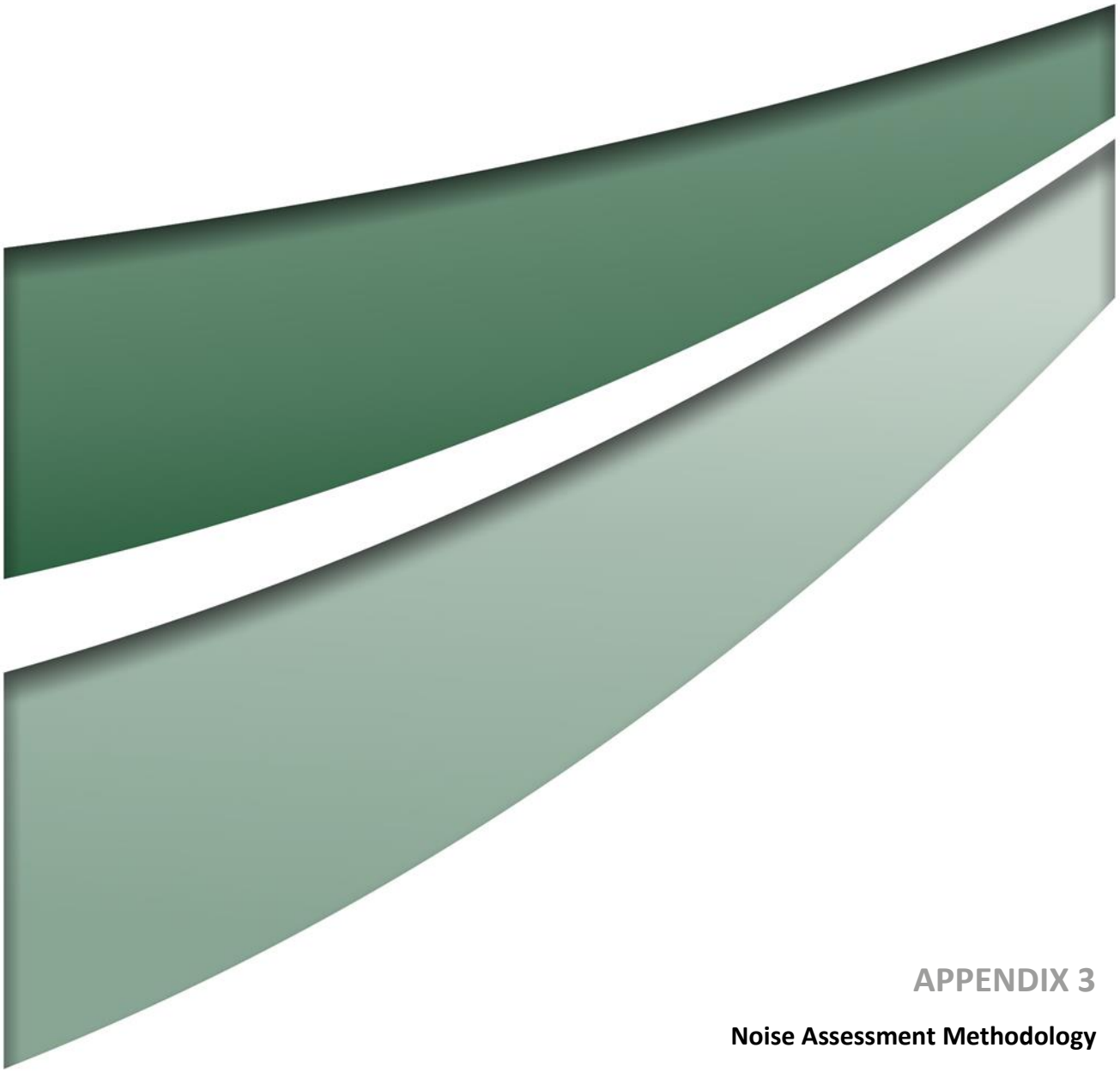
Activity Data		Emission Factors		
		CO_2	**CH_4**	**N_20**
Purchased energy	GJ	kg CO_2-e/GJ	kg CO_2-e/GJ	kg CO_2-e/GJ
Diesel	8,872,596	3.6	N/A	N/A
Electricity	1,344,768	28	N/A	N/A
		t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG Emissions (t CO_2-e)		69,594	N/A	N/A
Total GHG Emissions (t CO_2-e)				**69,594**

Product Transport

Activity Data				Emission Factors		
				CO_2	**CH_4**	**N_20**
Transport mode	Product (t)	Distance (km)	Tonne km (tkm)	kg CO_2-e/tkm	kg CO_2-e/tkm	kg CO_2-e/tkm
Rail	19,237,049	92	1,769,808,508	0.0054	N/A	N/A
Ship	19,237,049	9,500	182,751,965,500	0.0126	N/A	N/A
				t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG Emissions (t CO_2-e)				2,312,232	N/A	N/A
Total GHG Emissions (t CO_2-e)						2,312,232

Materials Transport

Activity Data				Emission Factors		
				CO_2	**CH_4**	**N_20**
Transport mode	Materials (t)	Distance (km)	Tonne km (tkm)	kg CO_2-e/tkm	kg CO_2-e/tkm	kg CO_2-e/tkm
Truck – Diesel	229,860	230	52,867,800	0.14	N/A	N/A
Truck – Explosives	111,784	100	11,178,400	0.14	N/A	N/A
				t CO_2-e	t CO_2-e	t CO_2-e
Breakdown of individual GHG Emissions (t CO_2-e)				8,966	N/A	N/A
Total GHG Emissions (t CO_2-e)						**8,966**



APPENDIX 3

Noise Assessment Methodology

Appendix 3 – Noise Assessment Methodology

During the design phase of the Proposed Modification predictive noise models were used to systematically assess the reduction in the noise emission levels from the mining operations emission levels at the receiver locations that could be achieved through the implementation of a range of different noise control strategies. The objective is to identify a set of control strategies (long, medium and short term) that will enable the mining operation to stay within the target or license noise limits at each of the receiver locations. For an open cut coal mine, this can include changes to the overall mine plan and production schedule, the construction of noise bunds, changes to mining activities during specific meteorological conditions, changes to the dump design, and modifications to the fleet selection and associated sound power levels. The probabilistic noise modelling approach allows the impact of the temporal variations in the meteorological conditions on the propagation of sound from the source to the receiver to be considered. The probabilistic modelling approach includes the iterative implementation of the noise control strategies to determine the percentage of the time noise control strategies, such as machine relocation or shut down, need to be implemented.

A probabilistic noise model uses a detailed set of meteorological conditions that are representative of the meteorological conditions that would be expected during the life of the mine. The modelling approach involves analysing the local meteorological conditions to determine the percentage of occurrence of inversions and wind effects in the region for each respective season and time period. The predictive noise model is then run for each set of meteorological conditions described by the wind speed interval, wind direction interval and temperature gradients representing A to G class stability conditions for each noise source model receiver transmission path. The proportion of time each of these combinations applies is then combined with the resulting predicted sound pressure level to determine the emission level at the receiver location.

Table 1 provides an example of the step wise iteration of potential control options applied during winter evening night times for Receivers 7 and 13. The corresponding modelling results are provided in **Table 2** below.

Table 1 - Interpretation of Modelling Results for Revised 2026 Mine Plan – Winter Evening Night

Description	Predicted Operational Outcome	
	Receiver 7	Receiver 13
Full Operations with exposed haul roads and with day-only activities off (Model 2B-4, Sc.1)	Can operate 58% of Winter Evening Nights	Can operate 58% of Winter Evening Nights
Full Operations with revised haul road and with day-only activities off design (Model 2F-7, based on Sc.1)	Can operate 80% of Winter Evening Nights	Can operate 72% of Winter Evening Nights
Slow dump dozers, slow trucks on dumps and slow or stop most of the ancillary equipment (Model 2F-7, based on Sc.2c)	Constraint applies 20% Winter Evening Nights	Constraint applies 28% Winter Evening Nights
Shut down waste excavator EX03 and associated fleet (Model 2F-8, based on Sc.3b)	Constraint applies 16% Winter Evening Nights	Constraint applies 16% Winter Evening Nights
Shut down second waste excavator and associated fleet (Model 2F-9)	No additional constraint required	Constraint applies 12% Winter Evening Nights

The implementation of the noise controls are required to achieve the existing noise limit at Receivers 7 and 13 90% of the time. This is referred to as the 10^{th} %ile noise level. It should be noted that the meteorological conditions used to determine the 10^{th} %ile noise level include:

- Conditions associated with license limits:
    - Standard: A–D with wind speed up to 0.5 m/s at 10 m
    - Noise-enhancing: A–D with wind speed up to 3 m/s at 10 m, stability category F with winds up to 2 m/s.
- Noise-enhancing conditions:
    - A–D with wind speed up from 3 to 5 m/s at 10 m
    - Stability category F with winds above 2 m/s.
    - Stability category G

Meteorological conditions where it is raining, or the wind speeds are above 5m/s are not included in the probability predictions. The analysis includes noise-enhancing conditions that are not linked but where the conditions would enhance the noise propagation prior to the wind masking the noise signal from the mine. The 10^{th} %ile is considered representative of all the meteorological conditions associated with license limits.

Cumulative distribution charts are used to analyse the effectiveness of the control options. The step-wise iteration of one series of potential control options is demonstrated for Receiver R7 during the Winter evening nights of 2026 in **Figures 1** and **2**. The control strategy demonstrated in the example in **Figures 1** and **2** shows the difference between the full day-time level of operations and the likely level of full night-time operations (Sc.1). **Figure 2** shows the effect of the systematic slowing of the bulldozers (Sc.2a), slowing of trucks (Sc.2b), reduction of ancillary equipment (Sc.2c), shut down of bull dozers (Sc,3a) and the shutdown of excavator Ex03 and associated fleet (Sc.3b). Polyline curves have been used to enable the differences between the control strategy to be evident.

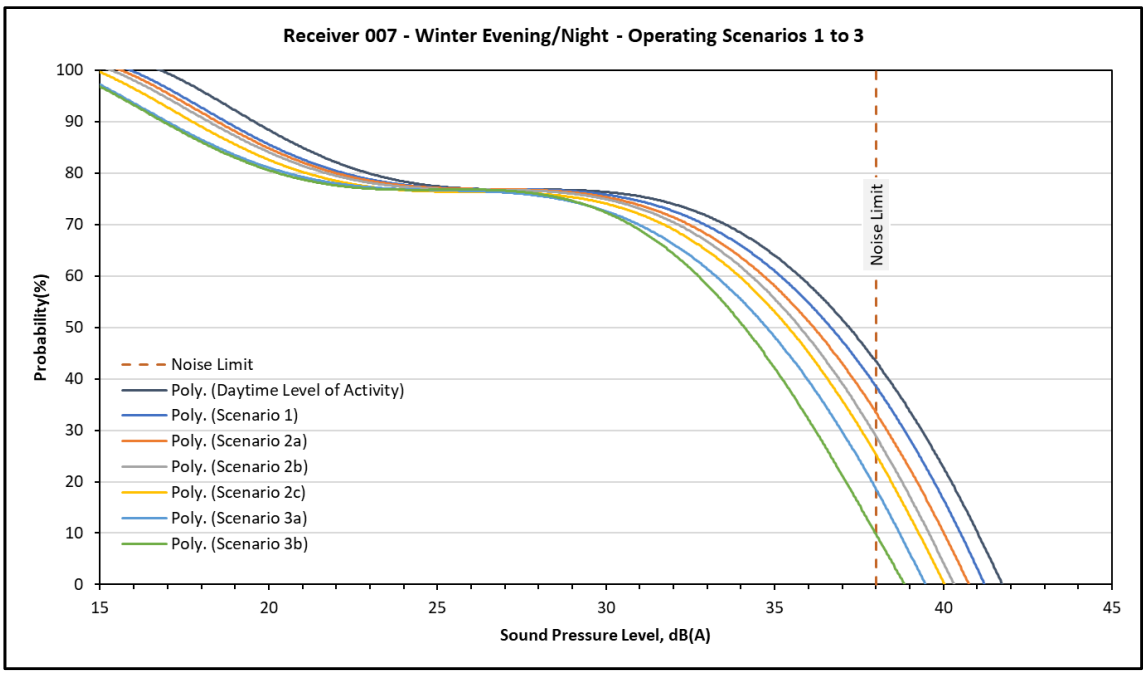


Figure 1 - Cumulative Distribution Charts showing the Effectiveness of Control Options, Winter Evening Night

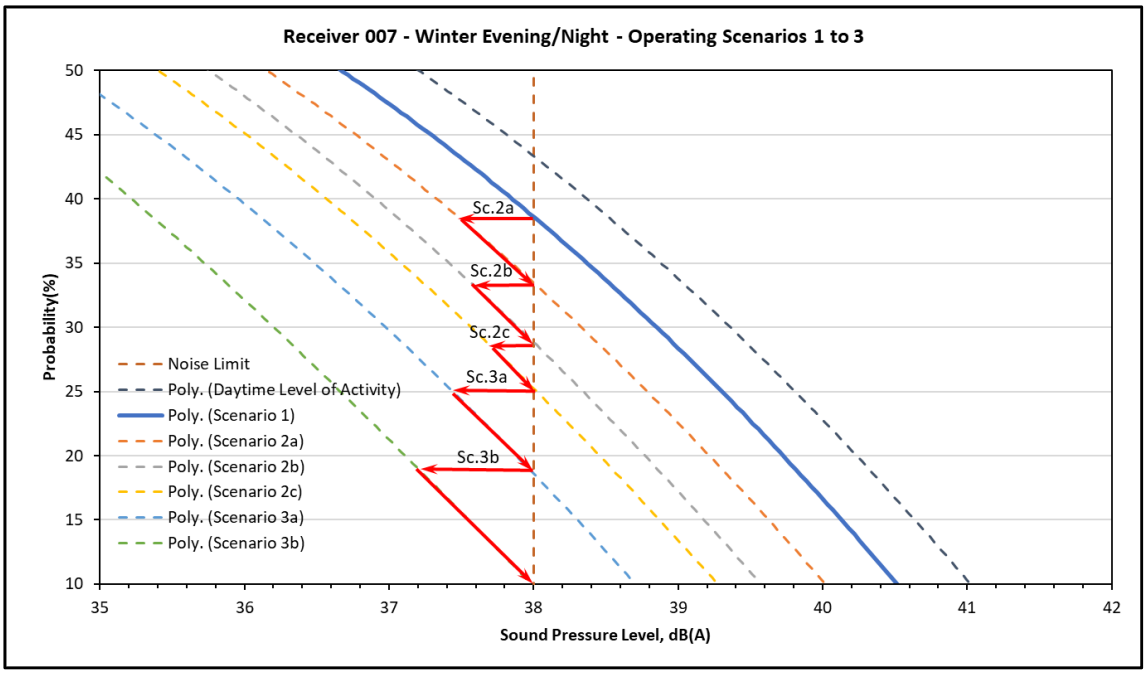


Figure 2 – Section of Cumulative Distribution Charts showing the Effect of the Step-wise Implementation of Noise Control Measures, Winter Evening Night

Results Analysis for 2026 Mine Plan – Winter Evening Night

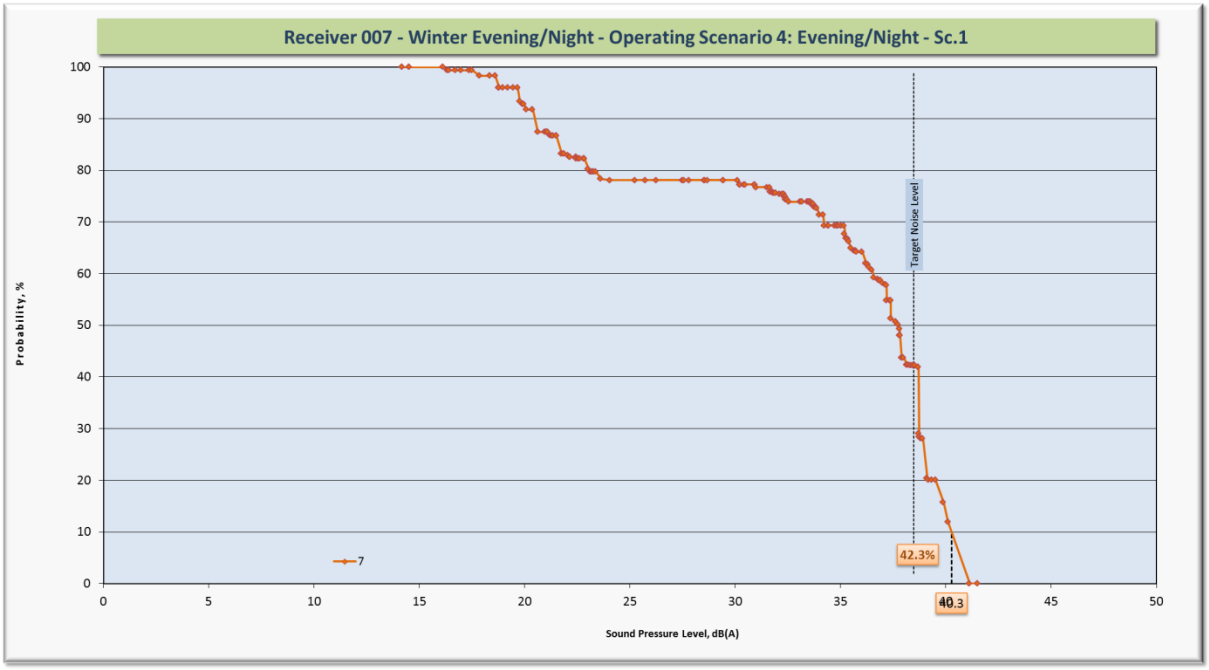
Table 2 Modelling Results for Revised 2026 Mine Plan – Winter Evening Night, dB(A)

				Receiver							
				7				13			
				All Seasons Day	Non-winter Evening	Non-winter Night	Winter Evening/Night	All Seasons Day	Non-winter Evening	Non-winter Night	Winter Evening/Night
Model	Scenario / Description		Limits	40	40	38	38	38	38	38	38
2B – 4	Sc.1	Unconstrained mining with day-only activities off	Exceedance (all met)	-	-	-	42%	-	-	-	42%
			Highest Lic Level	-	-	-	40	-	-	-	41
2F – 7	Sc.1a	Unconstrained mining with day-only activities off	Exceedance (all met)	-	-	-	20%	-	-	-	28%
			Highest Lic Level	-	-	-	40	-	-	-	40
2B – 5	Sc.2	W E/N - Sc.1 plus slow dozers, slow trucks on dump and most ancill	Exceedance (all met)	-	-	-	16%	-	-	-	28%
			Highest Lic Level	-	-	-	39	-	-	-	40
2F – 8	Sc.2c	W E/N - Sc.1a plus slow dozers, slow trucks on dump and most ancill	Exceedance (all met)	-	-	-	16%	-	-	-	16%
			Highest Lic Level	-	-	-	39	-	-	-	39
2B – 6	Sc.3	W E/N - Sc.2 plus shut down Ex3	Exceedance (all met)	-	-	-	0%	-	-	-	16%
			Highest Lic Level	-	-	-	38	-	-	-	39
2F – 9	Sc.3b	W E/N - Sc.2a plus shut down Ex03	Exceedance (all met)	-	-	-	0%	-	-	-	12%
			Highest Lic Level	-	-	-	38	-	-	-	38

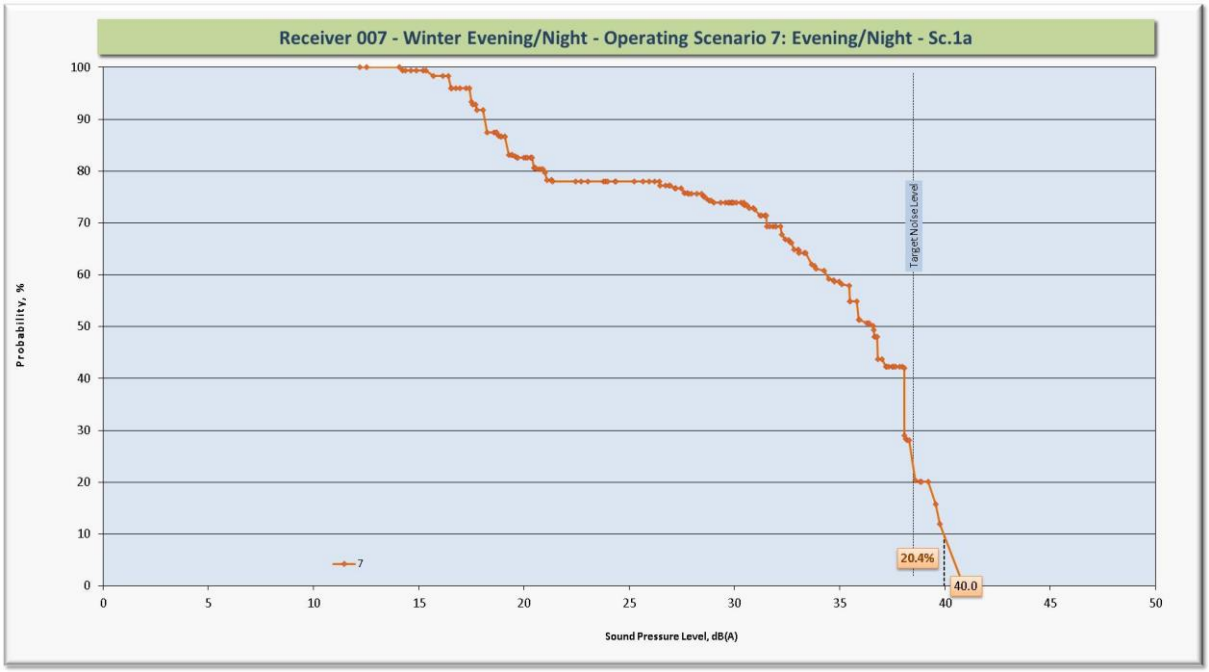
Note: Shaded cells from original modelling results compared to alternate haul string options – non-shaded

Receiver 7 - Winter Evening and Night

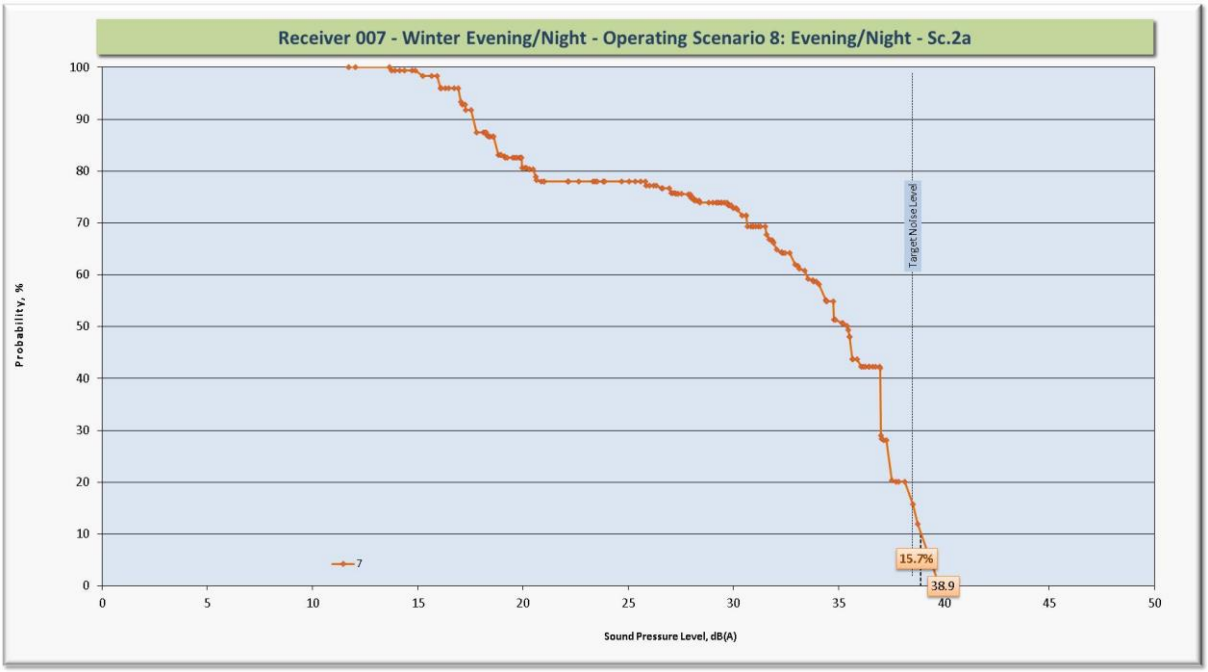
Sc.1 (Original): Unconstrained mining with rehab dozers and day-only activities off



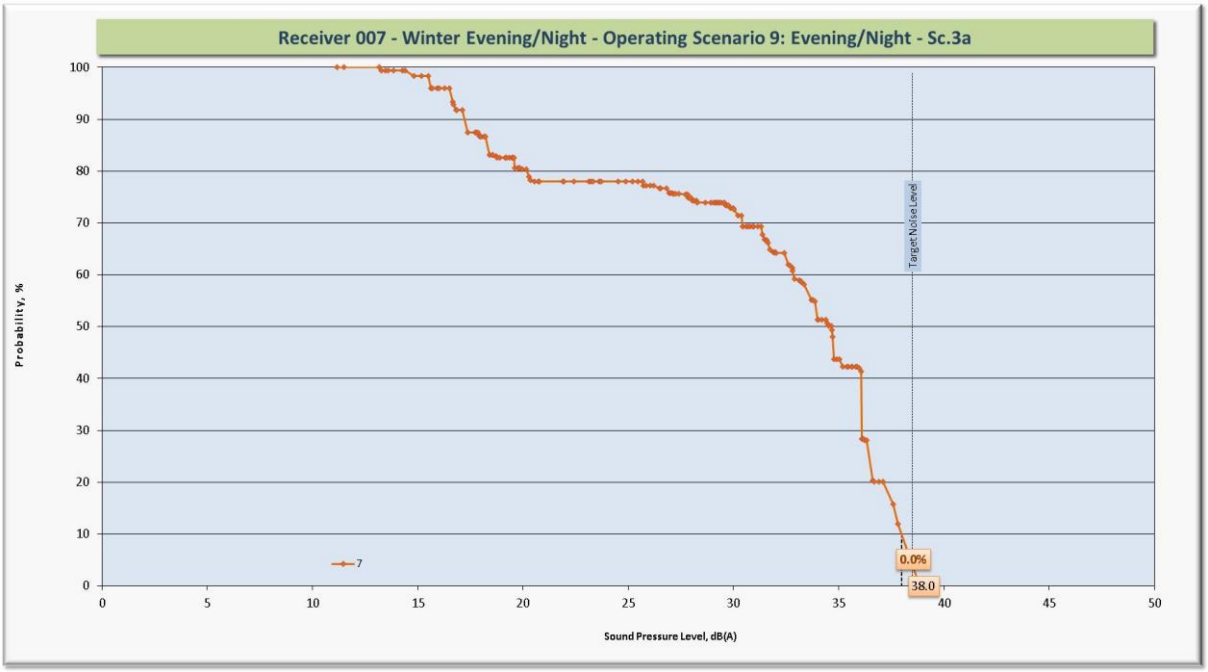
Sc.1a (Alternate haul string option): Unconstrained mining with rehab dozers and day-only activities off



Sc.2c (Alternate haul string option): Sc.1a plus 1st gear reverse for dozers in exposed locations and ancillary equipment strategically relocated or shutdown

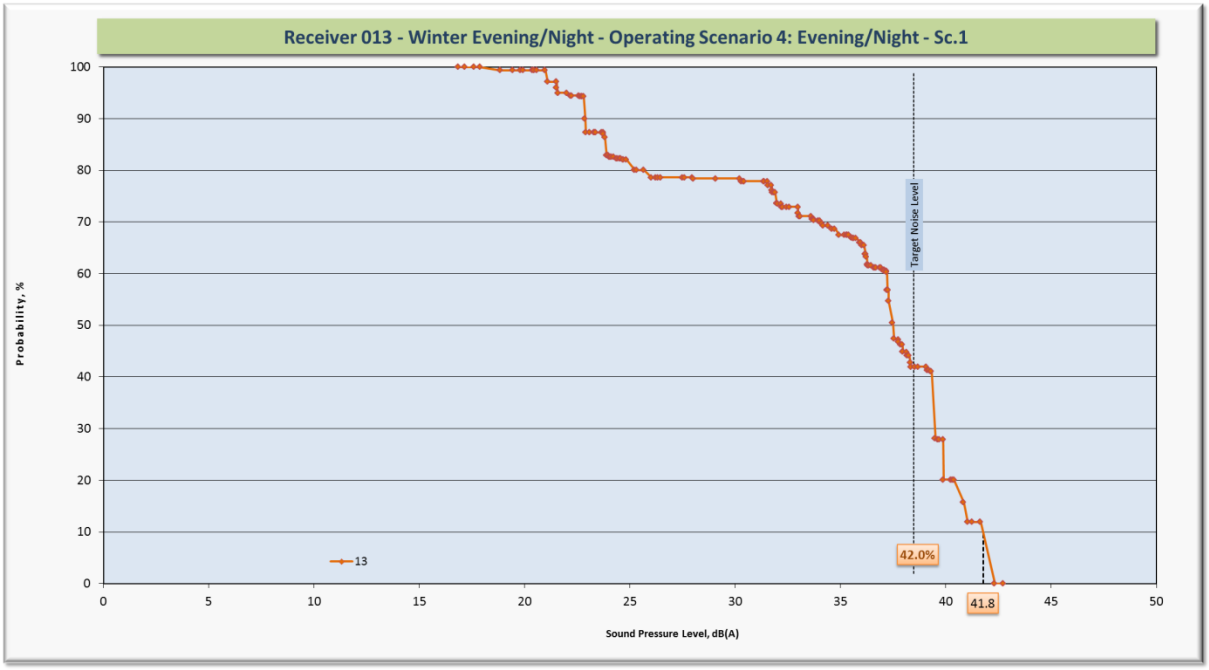


Sc.3b (Alternate haul string option): Sc.2c plus shut down Exc 3

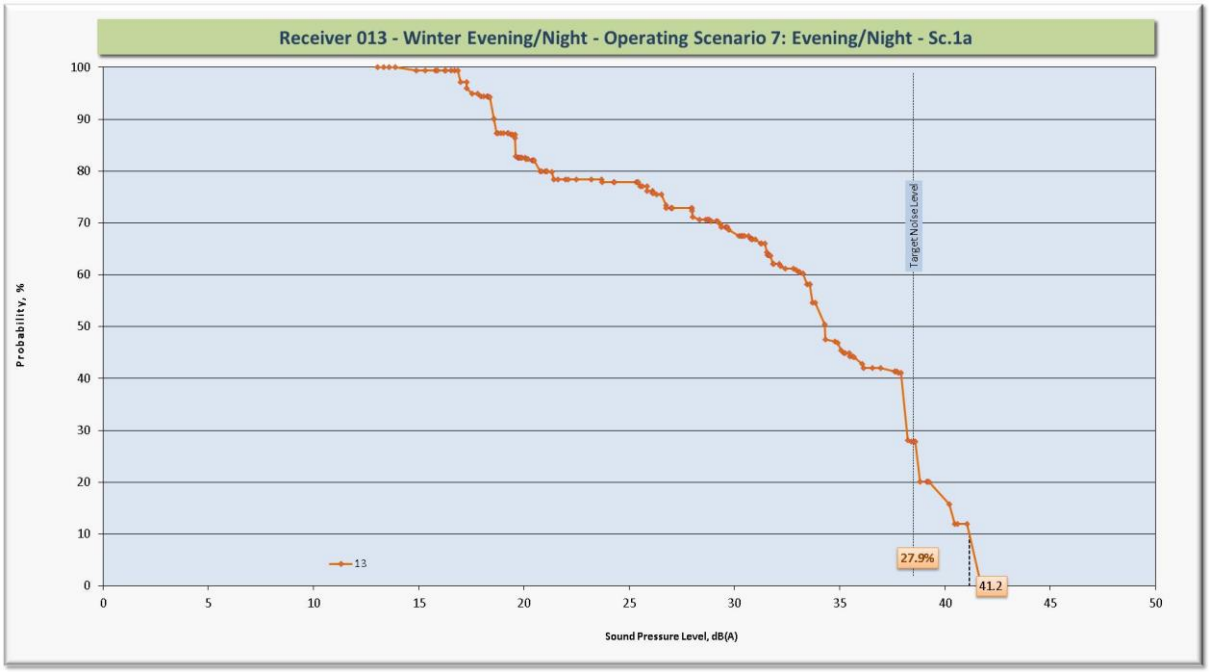


Receiver 13 - Winter Evening and Night

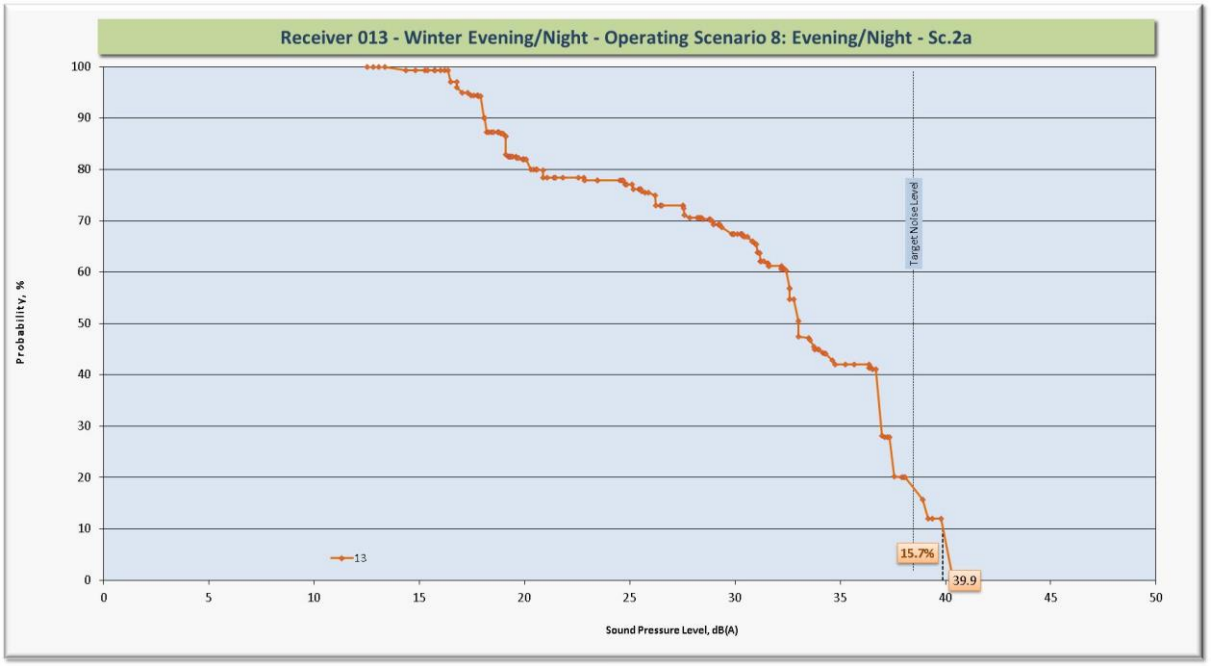
Sc.1 (Original): Unconstrained mining with rehab dozers and day-only activities off



Sc.1a (Alternate haul string option): Unconstrained mining with rehab dozers and day-only activities off



Sc.2c (Alternate haul string option): Sc.1a plus 1st gear reverse for dozers in exposed locations and ancillary equipment strategically relocated or shutdown



Sc.3b (Alternate haul string option): Sc.2c plus shut down Exc 3