MANGOOLA
OPEN CUT

GLENCORE

Blast Management Plan

Revision History

Version	Date Reviewed	Reviewed By	Amendment
1	1/5/2009	DoP&I	Original BMP approved by DP&I.
2	4/08/2010	Mangoola Coal	Submitted to DoP&I for review.
3	24/10/2010	Mangoola Coal	Comments from DoP&I review in August 2010 incorporated and sent as final for approval.
4	30/04/2013	Mangoola Coal	Review following Modification 4, updated following DP&I request for a Blast Fume Management Strategy and general review of monitoring sites/general content. Submitted to DP&I and EPA.
5	May 2013	Mangoola Coal	Re-submitted in June to DP&I with amendment to Electricity Transmission Line pylon PPV limits to reflect latest TransGrid Agreement.
6	September 2013	Mangoola Coal	BMP approved by DP&I on 11th September 2013. Approval letter attached and document date changed to September 2013.
7	June 2014	Mangoola Coal	Review following Modification 6
8	May 2015	Mangoola Coal	Updated to reflect EPL changes and monitoring station locations.
9	January 2016	Mangoola Coal	Updated to reflect: • Variation to EPL 12894 and changes to blast times contained in condition L4.5. Increase blast limits under agreement with TransGrid.
10	November 2016	Mangoola Coal	Updated to reflect: • Amended monitoring station location BM01 (north-west of operations; renamed to BM07) following acquisition of 281 Wybong PO Road by Mangoola Coal; • Removal of BM02 from the monitoring network due to duplication with BM03 (north-east of operations); • Removal of BM05 and BM06 whilst maintaining compliance with TransGrid agreement; • Removal of interim limit on rock shelters and formations (Project Approval condition regarding 'damage' to rock structures addressed);

			Inclusion of Dam Safety Committee approval requirements.
11	August 2017	Mangoola Coal	Updated in response to comments provided by Department of Planning & Environment including: • Annual review of safe blast vibration limit for rock structures Representative vibration monitoring at Anvil Rock
12	August 2017	Mangoola Coal	Formatting for website.
13	January 2019	Mangoola Coal	Updated to reflect: • Amended monitoring location following purchase of nearest private receptor to the south of the mining operation and subsequent EPL12984 variation. Addition of rockshelter identified in 2018 ACHOA inspection.
14	February 2019	Mangoola Coal	Approved by DP&E on 12.2.2019
15	December 2019	Mangoola Coal	Update of Table 4.1 to acknowledge additional monitoring and ladder required for monitoring of Anvil Rock.
16	May 2020	Mangoola Coal	Reviewed document. Added EPL reporting requirements (R2.2) to section 5.1. Updated table 4.2 to make remediation requirements specific to Anvil Rock as requested by DPE. Appended Blast Fume Management Procedure as Appendix D (now Appendix E) in accordance with DPE directive – Blast Fume Management Strategy 2012.
17	August 2020	Mangoola Coal	Administrative update – update to template. Content of Management Plan is unchanged and is as per V16 which is DPE approved.
18	September 2020	Mangoola Coal	Updated to reflect the blasting vibration limit for suspension towers as per TransGrid Agreement dated 17 September 2020.
19	January 2022	Mangoola Coal	Updated to reflect EPL variation (varied 6/12/2021) which includes changes to EPL premises boundary and associated conditions.
20	July 2022	Mangoola Coal	Updated to reflect the approval of MCCO Project under Development Consent SSD 8642.

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1. Introduction

Mangoola Coal Operations Pty Limited (Mangoola Coal) operates an open cut coal mine located near Wybong, approximately 20 kilometres west of Muswellbrook and approximately 10 kilometres north of Denman in the Muswellbrook Local Government Area (refer to ***Figure 1-1***). Mangoola has operated Mangoola Coal Mine under Project Approval (PA) 06_0014 since mining commenced at the site in September 2010.

In April 2021, Mangoola Coal was granted Development Consent under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) for State Significant Development (SSD) 8642 by the NSW Independent Planning Commission (IPC) for continued operations at the Mangoola Coal Mine (Mangoola). The Project Boundary for Mangoola Coal Mine is presented in ***Figure 1-1***.

1.1 Project Description

In accordance with State Significant Development (SSD) 8642, the MCCO Project has a maximum production rate of 13.5 million tonnes per annum (Mtpa) of run of mine (ROM) coal over a mine life through to the end of 2030. The primary mining method utilises hydraulic excavators loading rear dump trucks assisted by dozer push and cast blasting of overburden where appropriate. Dump trucks haul ROM coal to the coal handling facilities along haul roads. The general mining sequence includes the stripping of topsoil (including its storage for future rehabilitation), removal of overburden, extraction of coal resource, in pit overburden emplacement followed by progressive site rehabilitation.

Mining operations, coal handling and washing, rail load out and all associated activities operate on a 24 hours per day, seven days per week basis with the exception of the mobile gravel crushing plant which is restricted to 7 am to 6 pm Monday to Friday and 8 am to 1 pm on Saturdays with no operations on public holidays or Sundays unless under certain circumstances and with the written approval of the Planning Secretary.

In accordance with SSD and EPL conditions, blasting at MCCO Project is restricted to between 9 am and 5 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the prior written approval of the Planning Secretary and the EPA.

A detailed description of MCCO Project is provided in the ***MCCO Project Envionmental Impact Statement (EIS)*** prepared by Umwelt (2019). An overview of blast impact assessment findings can be found in ***Blasting Impact Assessment*** by Enviro Strata Consulting Pty. Ltd. (ESC) in Appendix 10 of the EIS (Umwelt (2019)).

The conceptual mine plan scenarios utilised in Appendix 10 of the EIS for MCCO Project include:

- Year 1 – (end 2023) mining activities commence in the southern section of the MCCO Project mining area and progress in a north-westerly direction. The overburden emplacement area established in the south-east section. Construction of a haul road overpass over Wybong Rd and Big Flat Creek to provide access from the existing mine to the MCCO Project mining area;
- Year 5 – (end 2027) coal extraction and blasting activities concentrate in the central section of the MCCO Project mining area. Extraction will generally advance in a north–westerly direction; and
- Year 8 (end 2030) – coal extraction continues in a north-westerly area of the mine and represents the end stage of the mine life

Mangoola Coal mining operations are surrounded by sparesly located sensitive receptors including private residences, heritage structures, rock formations, Aboriginal rock shelters, electricity transmission lines and public roads. Blast design and mitigation measures will be varied throughout the life of the MCCO Project to minimise impacts on these receptors as operations progress towards sensitive receptors.

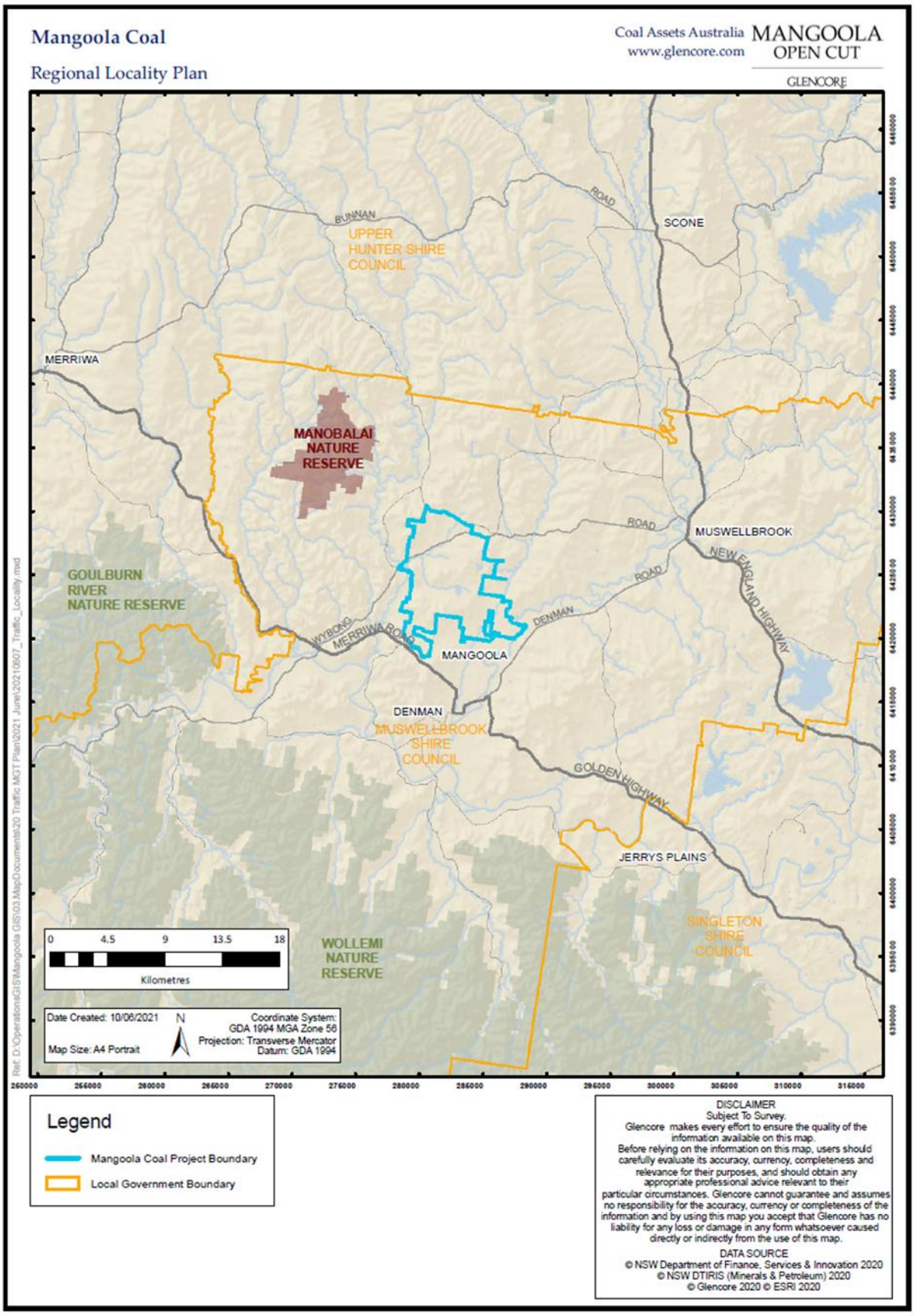

Figure 1-1 Regional Locality Plan

1.2 Purpose and Scope

To satisfy Schedule 2, Part B , Conditions B23 – B25 of SSD 8642, a Blast Management Plan (BMP) is required to be prepared and implemented for the MCCO Project to the satisfaction of the Planning Secretary prior to blasting north of Wybong Road.

The BMP has been prepared to manage blast related impacts including ground vibration, airblast overpressure, flyrock, blast fume, dust and odour.

1.3 Objectives

The objectives of this BMP include:

- outline applicable ground vibration and airblast overpressure limits
- describe the measures that will be implemented to ensure compliance with the blast criteria and operating conditions of SSD 8642;
- propose and justify any alternative ground vibration limits for public infrastructure in the vicinity of the site (refer to ***Section 2***);
- establish a blast monitoring system to assess the airblast overpressure and ground vibration impact on surrounding sensitive receivers (refer to ***Section 4.2***);
- manage blast related community complaints in a timely and effective manner (refer to ***Section 5.3***); and
- detail the procedure for reporting blast criteria exceedances to the relevant stakeholders (refer to ***Section 5.5***).

1.4 Regulatory Requirements and Other Commitments

1.4.1 State Significant Development Consent

Development Consent SSD 8642 for the MCCO Project was granted by the Independent Planning Commission of NSW under clause 8A of the State Environmental Planning Policy (State and Regional Development 2011 and Section 4.5(a) of the EP&A Act 1979 on 26 April 2021. The requirement for this BMP arises from Schedule 2, Part B, Conditions B23 – B25 of SSD 8642. A detailed list of SSD 8642 conditions and where they are addressed in this document is included in ***Appendix B -***.

1.4.2 Environment Protection Licence

Mangoola Coal was issued Environment Protection Licence (EPL) 12894 on 7 July 2008. A full list of the current EPL 12984 conditions relating to blasting and where they are addressed within this document is included in ***Appendix B -***.

In accordance with L4.6 offensive blast fume will not be emitted from the premises (EPL Premise Boundary).

1.4.3 Dams Safety Act

Mangoola Coal has onsite water dams and tailings storage facilities which are classed as declared (previously named as prescribed) dams under the requirements of the NSW Dams Safety Act 1978 2015 No 26. These dams are within areas designated by the Dams Safety NSW (former NSW Dams Safety Committee (DSC)) as Mangoola-3 and Mangoola-4. In July 2021, The (then) DSC removed the

requirement to monitor declared (prescribed) dams for blasting activities as blasting was no longer occurring in the dam notification area. The Planning Secretary was advised of this on 29 July 2022.

1.4.4 Statement of Commitments

Mangoolas consolidated Statement of Commitments describes key management and mitigation measures relevant for MCCO Project. The commitments relevant to blasting are presented in ***Appendix A*** -.

1.5 Roles and Responsibilities

The roles and responsibilities of Mangoola Coal employees and contractors in relation to blast management and monitoring are outlined in ***Table 1-1***.

Table 1-1 – Roles and Responsibilities

Role	Responsibilities
Operations Manager	• providing that sufficient resources are allocated for the implementation of this BMP.
Mine / Technical Services Manager	• implementation of this plan for mining operations to ensure compliance with consent requirements. • Coordinate design of blasting in accordance with safe blast limit for Anvil Rock, the Book and Rock Shelters
Environment and Community Manager	• coordinate training to communicate requirements of this BMP to relevant personnel; • provide resourcing and support to allow effective implementation of blast monitoring in accordance with this BMP; • coordinate, advise and assist with the implementation of the BMP; • notify regulatory authorities and affected landholders of any blasting related exceedance and undertake associated reporting; • complete reporting requirements for Annual Review and Annual return regarding blasting management; • update monitoring data on the Mangoola Coal website; • maintain the Community Response Line and Blasting Hotline and advertise in local newspapers; and • where relevant, notify private residents of blasting times.
Drill and Blast Engineer	• regularly review blast design parameters on the basis of blast monitoring records; • design and carry out blasts to comply with the requirements of this BMP, including the identification of meteorological parameters; • conduct pre-blast meteorological assessments in accordance with site procedures; and • maintain records for blasts initiated.
Drill and Blast Supervisor	• ensure the drill pattern is drilled in accordance with the blast design; and • ensure that the blast is loaded with the correct quantity and quality of explosive and stemmed in accordance with the blast design.

Role	Responsibilities
Shotfirers	• notify the Drill and Blast Engineer and Supervisor of any factors that may lead to non-compliance with this BMP; and • load and fire blasts in accordance with the design supplied by the Drill and Blast Engineer.
Blast Controller	• implement and comply with the pre-blast environmental assessment process.
All employees and contractors	• comply with the requirements of this BMP.

1.6 Definitions

The terminology utilised within this BMP is defined in ***Table 1-2***.

Table 1-2– Terminology utilised within the BMP

Term	Definition
Airblast overpressure	An airborne shock wave resulting from detonation of explosives. An airblast may be caused by blasted material movement or the release of expanding gas into the air.
Blasting	Any activity involving the use of explosives for the purpose of producing an explosion to fragment rock for mining.
Blast event	A number of individual blasts fired in quick succession in a discrete area of the mine.
Blast misfire	The failure of one or more holes in a blast pattern to initiate
dB (Lin Peak)	Decibel Linear Peak: the maximum level of air pressure fluctuation measured in decibels (dB) without frequency weighting; used to quantify blast overpressure.
DPE	NSW Department of Planning and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
Flyrock	Rock that is propelled outside of the blasting area through the air or along the ground as a result of the detonation of explosives.
Ground vibration	The movement of the ground caused by the blast wave emanating from the blast.
kV	Kilovolt (1000 volts)
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
Planning Secretary	Planning Secretary under the EP&A Act ,or nominee
PPV	Peak Particle Velocity. A measure of ground vibration. Particle velocity describes the velocity at which a particle of ground vibrates as a result of a seismic wave.
Privately-owned land	Land that is not owned by a public agency, or a mining company (or its subsidiary).
Proponent	Mangoola Coal Operations Pty Limited

Term	Definition
Residence	An occupied dwelling (blast criteria does not apply to unoccupied dwellings).

2. Blasting Criteria & Frequency

Blasting impacts resulting from operations at Mangoola Coal must not exceed the criteria specified in ***Table 2-1***.

Table 2-1 – Blasting criteria for MCCO

Location	Airblast Overpressure (dB (Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance
Residence on privately owned land; and EPL Monitoring Points 16, 21, 32	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
Yarlett Wybong Cemetery Wybong Hall Yarraman	133	5	0%
Anvil Rock The Book	n/a	50	0%
Aboriginal Rock Shelter Sites	n/a	50	0%
500kV transmission line pylons – tension towers	n/a	60[1]	0%
500kV transmission line pylons – suspension towers	n/a	150[1]	0%
11kV transmission line – timber poles	n/a	100	0%
Prescribed (declared) water dams	n/a	50[2]	0%
Prescribed (declared) tailings dams	n/a	100[2]	0%
Public roads, Telecommunication infrastructure and cables	n/a	100	0%
All other public infrastructure	n/a	50[3]	0%

[1] As per TransGrid Agreement letter dated 7/09/2015 and TransGrid Agreement letter dated 17/09/2020, refer to Appendix C.

[2]Former DSC removed requirement to monitor Prescribed (declared) dams as blasting no longer occurs in the dam notification areas for Tailings Dams 1 and 2, Pit Water Dam and Raw Water Dam.

[3] 50 mm/s limit or a limit determined by the structural design methodology in AS 2187.2 – 2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Planning Secretary.

In accordance with SSD 8642 (Schedule 2, part B, Condition B13) and EPL 12894, Mangoola Coal must only carry out blasting between 9 am and 5 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays or any other time without the prior written approval of the Planning Secretary.

Additionally, in accordance with SSD 8642 (Schedule 2, Part B, Condition B14), blasting at Mangoola Coal will be limited to the following frequencies with a maximum of:

- 2 single blast events a day; and
- 6 single blast events a week, averaged over a calendar year.

This condition(B14) does not apply to single blast events that generate ground vibration of 0.5 mm/s or less at any residence or privately owned land, blast misfires or blasts required to ensure the safety of the mine, its workers or the general public (as per Condition B15 of SSD 8642). For the purposes of the above conditions (Condition B14 and B15 of SSD 8642), 'single blast event' refers to a blast which involves either a single detonation or a number of individual blasts fired in quick succession in a discrete area of the mine. In the event of an additional blast after a blast misfire, this additional blast and the blast misfire are counted as a single blast.

In compliance with Schedule 2, Part B, Condition B22 of SSD 8642, Mangoola Coal will not undertake blasting within 500m of any public road or any land outside the site not owned by the Applicant unless the Applicant has:

a) a written agreement with the relevant infrastructure owner or landowner to allow blasting to be carried out closer to the public road or land, and the Applicant has advised the DPE in writing of the terms of this agreement, or

b) demonstrated to the satisfaction of the Planning Secretary, that the blasting can be carried out closer to the public road or land without compromising the safety of people or livestock or damaging the road or other buildings and structures, and updated the Blast Managemnt Plan to include specific mitigation measures to be implemented while blasting is being carried out within 500m of the road or land.

The Mangoola Coal Road Closure Management Plan details how these requirements are met (refer to ***Appendix D***).

Supplementary restrictions may also apply when blasting is planned within 500m of any local road. These conditions are detailed within the Mangoola Coal Road Closure Management Plan and include:

a) confining blasts between 10 am and 2 pm weekdays (excluding public holidays);

b) minimise the frequency and duration of any public road closures for blasting, and use all reasonable efforts to avoid road closures during peak traffic periods (as per Schedule 2 Condition B21d of SSD 8642); and

c) As per the Statement of Commitment, blasting road closures will be limited to one planned closure per day. If additional road closures are required the DPE will be consulted.

Mangoola Coal will conduct a Seed Hole Blasting Program prior to the commencement of mining in the MCCO project area. The program will not extract, process or transport coal nor involve the emplacement of vegetation, topsoil, overburden, tailings or reject material.

Seed hole blasting is a best practice process of assessing site specific constants required to ensure compliance with blasting vibration limits and improve blast design processes. Data captured during the program will be used to effectively time the firing of individual blast holes in larger shots in a way that maximises blasted volumes while ensuring compliance to vibration limits.

Blasting conducted during the program will not generate greater than 0.5mm/s ground vibration at any residence on privately owned land and will therefore will not trigger a *"blast event"* as defined in Schedule 2 Condition B15 of SSD 8642.

3. Blast Management Controls

Blast management and mitigation practices have been developed at Mangoola to minimise the impact of blast fume, dust, odour, fly rock, ground vibration and airblast overpressure. The procedures aim to minimise the impacts to human safety, property and public infrastructure, as well as the blast impacts mentioned above. Blasting impacts upon Aboriginal and cultural heritage items are further addressed in the Mangoola Coal Aboriginal Cultural Heritage Management Plan (ACHMP) and Mangoola Coal Historic Heritage Management Plan (a requirement for MCCO Project, Schedule 2, Part B, Conditions B71 – B73 of SSD 8642). These procedures will be revised and updated as required based on the outcomes of the blast monitoring program described in ***Section 4.2***.

The original Mangoola Coal Blast Fume Management Procedure (BFMP) was developed in 2012 to the satisfaction of the Secretary and in accordance with DPE requirements received in writing in 2012 (see ***Appendix E***). The BFMP identifies a number of specific control measures for fume management at Mangoola Coal not covered below and is published on the company website.

Specific controls and mitigation measures employed at Mangoola Coal to minimise blast impacts and ensure compliance with relevant SSD 8642 and EPL 12894 criteria are listed in the following sections.

3.1 Design Controls

A number of blast management controls are incorporated in to the blast design process at Mangoola Coal. These include:

- blast initiation using electronic detonation techniques;
- limiting blast Maximum Instantaneous Charge (MIC) via bench height control or application of deck charges;
- implementing a delay detonation system to minimise hole interaction;
- blast initiation using electronic detonation techniques; and
- use of appropriate stemming length and stemming quality to ensure maximum confinement of the explosives.

3.2 Operational Controls

In addition to design controls, Mangoola Coal implements a number of operational control measures to manage blast related impacts. These controls include:

- application of appropriate blast design;
- use of proven blast designs whenever possible for consistency of results;

- conducting a pre blast assessment with consideration to meteorological conditions (including wind speed and direction, wind shear and strength of any temperature inversions);
- use of monitoring data, where applicable, to refine blast design, on bench practices and site models used to predict blasting impacts; and
- adherence to drilling and hole loading designs.

3.2.1 Road Closure Management

Prior to blasting within 500m of Wybong Road, Wybong PO Road, Ridgelands Road or Hidden Valley Right of Way (ROW), Mangoola Coal will implement the Mangoola Coal Road Closure Management Plan (refer to ***Appendix D***). The purpose of this procedure is to provide a management strategy and operating procedure for temporary road closure/s when blasting is required within 500m of any of these roads/ROW. This radius may be increased if the risk of fly-rock is considered high, or where there is any other potential risk to road users, or any other environmental factor that requires road closure (e.g. high fume potential).

The key aspects of the Road Closure Management Plan include:

- the notification of affected parties;
- procedures for road closure and traffic management;
- procedures for modified shot-firing; and
- a protocol for the passage of emergency vehicles.

Note: As per Condition A2.1 of EPL 12894, public roads are not part of the premises unless temporarily or permanently closed in accordance with the Roads Act 1993 or an agreement is in place with the relevant Road Authority.

3.3 Continuous Improvement

Mangoola Coal will seek to undertake continuous improvement of blast management across operations. The basis for continuous improvement of blast mitigation measures will be through the ongoing monitoring of blast results. Any new management measures that are implemented as a result of these investigations will be reported in the Annual Review.

Mangoola Coal will also maintain awareness of new technologies for blast management and impact mitigation through participation in relevant industry groups.

3.4 Training

Training will be provided to personnel and contractors who require specific skills or knowledge relating to blast impacts and mitigation. Training will be undertaken in accordance with this BMP and will address the roles and responsibilities of relevant personnel.

4. Blast Monitoring Methodology

All monitoring is to be undertaken in accordance with the approved Mangoola BMP and conditions of SSD 8642 and EPL 12894 and relevant standards identified in ***Section 4.1***.

4.1 Monitoring Standards

Instrumentation used to measure the airblast overpressure and ground vibration levels must meet the requirements of Australian Standard AS 2187.2-2006 'Explosives – Storage and use – Use of explosives'.

Meteorological monitoring is undertaken in accordance with the 'Approved methods for the sampling and analysis of air pollutants in NSW' (DEC 2007) which refers to Australian Standard AS2923 -1987 (Guide for measurement of horizontal wind for air quality applications).

4.2 Blast Monitoring

Blasts are monitored against the criteria specified in SSD 8642 and EPL 12894 (refer to ***Appendix B***).

In June 2012 the DPE requested monitoring of blast fumes. This includes documenting a blast fume rating and video record each blast. Details of strategies for managing, monitoring and responding to blast fume are documented in the BFMP.

The prescribed blast monitoring locations are shown on ***Figure 4.1*** and ***Table 4.1***. The monitoring includes permanent stations (representing private residences, heritage sites and rock formations) and periodic blast monitoring stations (for infrastructure facilities). Additionally fixed and/or portable units may be used for monitoring the nearest rock shelter to the blast (which will vary depending on the location of the blast throughout the life of the mine).

As detailed in ***Section 4.4.4*** due to variable distance to blasting zone and limited impact on the infrastructure when blasting in excess of a 300 m, the mine undertakes only periodic monitoring of the infrastructure such as 11 kV transmission lines and public roads and other cables/infrastructure in the near vicinity as relevant. Infrastructure monitoring is undertaken at the site closest to the blasting zone when within 300 m from a blast. Monitoring of the 500 kV transmission line will follow the existing monitoring procedure.

Data collected from the monitoring of each blast will include:

- measured ground vibration at each monitoring location;
- measured overpressure at each monitoring location (where relevant);
- distance from blast to each monitoring location;
- number of holes;
- blast type;
- blast fume rating according to the Prevention and Management of Blast Generated NOx Gases in Surface Blasting (Australian Explosives Industry and Safety Group Inc., 2011);
- blast video record;
- meteorological conditions; and
- blast notifications to neighbouring mines and private residences.

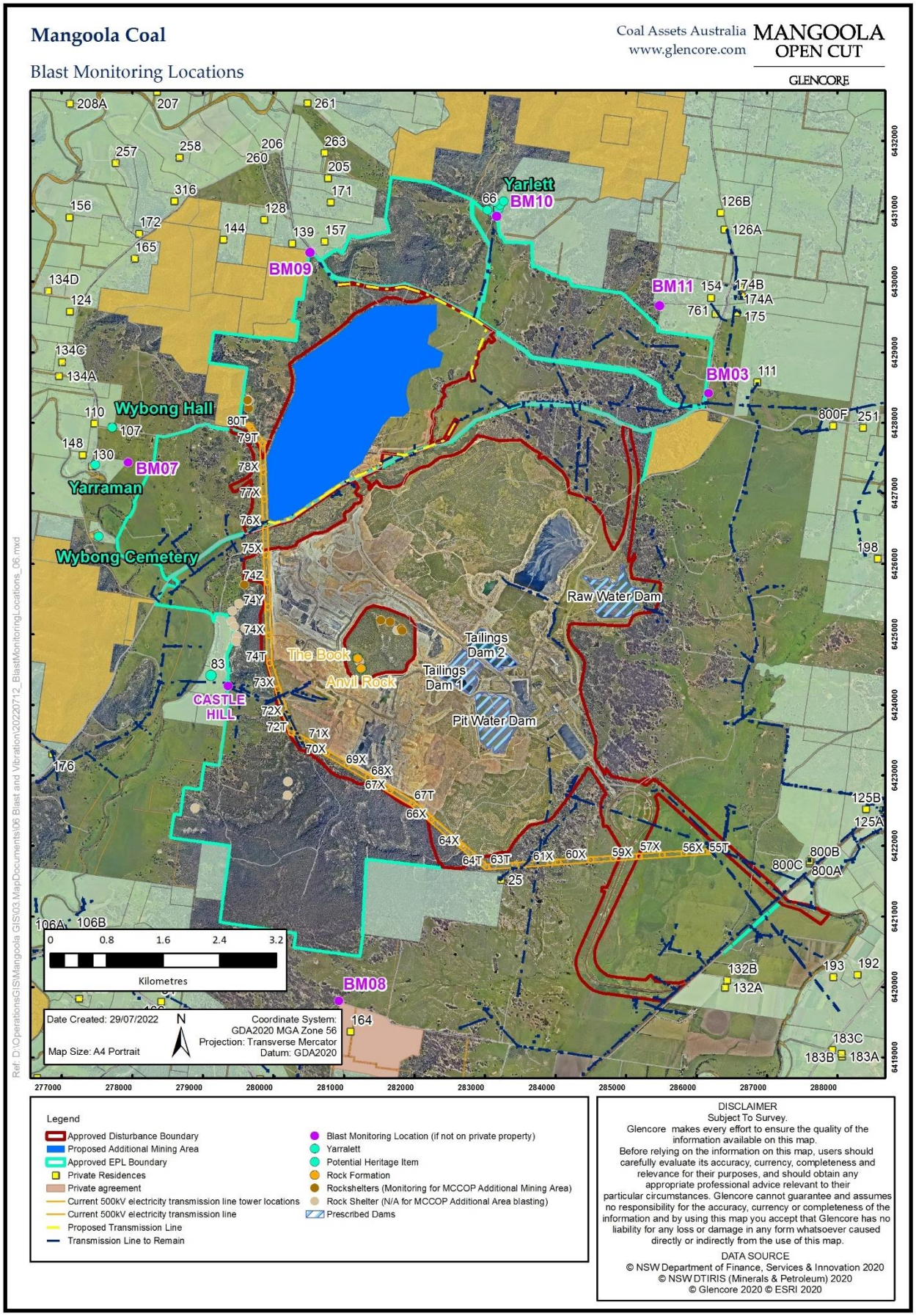

Figure 4-1–Blast Monitoring Locations

Table 4-1 - Compliance Monitoring Location Summary

Monitoring Location Requirement	Monitoring Site Name	Monitor I.D. (refer to Figure 4.1)	Blast Area Monitor is Applicable to	Airblast Overpressure Limit dB (Lin Peak)	Ground Vibration Limit (PPV)	Comments
SSD 8642: Residence on privately owned land **EPL[2]:** At monitoring points 16, 21 and 32	Private Property NW	BM07 (EPL ID: 21)	Mangoola[1] **and** MCCO Project Additional Mining Area	115 (allowable exceedance of 5% over 12 months) and 120	5 mm/s (allowable exceedance of 5% over 12 months) and 10 mm/s	Blast monitoring is conducted at the nearest residence on privately owned land to the blast zones (or representative location on mine-owned land that is not further than the nearest residence). Locations may change over the life of the mine as properties are acquired and the mining progresses or with the written approval of the Planning Secretary. Criteria applies to the nearest privately owned residence (as per ***Table 1-2*** definition). NOTES 1. Monitors that are **only** applicable for the MCCO Project Additional Mining Area will be installed prior to the commencement of blasting within the MCCO Project Additional Mining Area (i.e. they are not considered compliance monitors until the first blast event in that area). They are not considered compliance monitors for the Mangoola[1] area south of Wybong Road. 2. Monitors that are **only** applicable to the Mangoola[1] mining area (south of Wybong Road) are not considered compliance monitors for blasting in the MCCO Project Additional Mining Area. These monitors may be decommissioned at the end of blasting in the Mangoola[1] area. 3. The EPL currently requires blast monitoring at monitoring points 16, 21 and 32 as per Condition M7.1. Monitoring at EPL points 16 and 32 will continue until blasting ceases south of Wybong Road and/or licence is varied to remove these locations.
	Church NE	BM03 (EPL ID: 16)	Mangoola[1]			
	Private Property South	BM08 (EPL ID: 32)	Mangoola[1]			
SSD 8642: Residence on privately owned land	Private Property North-west *(residence ID139[2] or ID157[2])*	BM09	MCCO Project Additional Mining Area			
	Private Property North *(residence ID66[2])*	BM10	MCCO Project Additional Mining Area			
	Private Property East *(residence ID154[2])*	BM11	MCCO Project Additional Mining Area			
SSD 8642: Yarlett	Yarlett	BM10	MCCO Project Additional Mining Area	133	5 mm/s	Blast monitoring is conducted in the vicinity of Yarlett, Wybong Cemetery, Wybong Hall and Yarraman in accordance with SSD 8642.

Wybong Cemetery Wybong Hall Yarraman	Yarrraman Wybong Cemetery Wybong Hall	BM07	MCCO Project Additional Mining Area			These locations are only required to be monitored once blasting activities commence in the MCCO Project Additional Mining Area. NOTE: BM07 represents multiple sites: Wybong Cemetery, Wybong Hall and Yarraman.
HHMP: Castle Hill	Castle Hill	Castle Hill	Mangoola[1]	N/A (not measured)	20 mm/s	Blast monitoring also occurs at a representative location for the Castle Hill slab hut under the HHMP for the duration of blasting activities within the Mangoola[1] area south of Wybong Road. It is not considered a compliance monitor for the MCCO Project Additional Mining Area blasting activities.
SSD 8642: Anvil Rock The Book	Anvil Rock The Book		Mangoola[1] and MCCO Project Additional Mining Area	N/A (not measured)	50 mm/s	Representative blast monitoring of Anvil Rock, the Book and closest rock shelter for every blast will occur to inform vibration monitoring. Blast monitoring is conducted at the closest rock shelter sites to the blast zone. This may change depending on the location of the blast. NOTES: 1. If there are safety concerns or technological limitations for rock formation monitoring, advice will be sought from a suitably qualified specialist to determine the best location for monitoring to provide a representative result at the location. 2. Monitoring equipment and an access ladders have been placed on Anvil Rock and the adjacent ridgeline to enable safe access and further gather data as per specialist's recommendations. This monitoring equipment will remain in place up until blasting within the approved mine has been completed. 3. For Anvil Rock the monitoring equipment will be removed following the completion of blasting in the approved mine or as approved by the Planning Secretary. Locally sourced material along with cement may be used to fill any anchor holes (size approx. 2cm diameter) should these have been required to install any monitoring or access equipment. 4. Monitors may be removed from rock shelter locations that are no longer nearest to blasting activities. 5. For blasting within the MCCO Project Additional Mining Area, a single representative blast monitoring unit for Anvil Rock, the Book and rock shelter sites (CG01, CG08/9 and CG19) may be used to inform vibration monitoring.
SSD 8642: Aboriginal Rock Shelter Sites	Rock shelter sites		Mangoola[1] and MCCO Project Additional Mining Area	N/A (not measured)	50 mm/s	

SSD 8642 **(as amended by TransGrid Agreement):** 500 kV Transmission Line	Pylon 64X through to Pylon 75X		Mangoola[1]	N/A (not measured)	60 mm/s* for tension towers 150 mm/s* for suspension towers	Blast monitoring is conducted at the closest pylon of the 500kV transmission line when the predicted PPV exceeds 60 mm/s (for suspension towers) or 30 mm/s (for tension towers). Monitoring requirements and limits apply as per agreement with the infrastructure owner (TransGrid).
	Suspension Pylons: 76X, 77X and 78X Tension Pylons: 79T, 80T		MCCO Project Additional Mining Area	N/A (not measured)	60 mm/s* for tension towers 150 mm/s* for suspension towers	
SSD 8642: 11kV Transmission Line – timber poles	Poles: 11kV1 through to 11kV6		MCCO Project Additional Mining Area	N/A (not measured)	100 mm/s	Periodic monitoring only – conducted at the closest pole of the 11kV transmission line when within 300 m from the blast zone.
SSD 8642: Prescribed (declared) Water Dams	Dam (RWD and PWD)		N/A (see Note on right)	N/A (not measured)	50 mm/s	On 16 March 2021, the conditions of the Dams Safety NSW approvals were amended to remove the blast monitoring requirements. The Planning Secretary was notified of this amendment on 29/07/2022.
SSD 8642: Prescribed (declared) Tailings Dams	Dam (TD1 and TD2)		N/A (see Note on right)	N/A (not measured)	100 mm/s	
SSD 8642: Public Roads, Telecommunications infrastructure and cables.	Road (Wybong Road, Ridgelands Road) + other cables/ infrastructure in vicinity.		MCCO Project Additional Mining Area	N/A (not measured)	100 mm/s	Periodic monitoring only - when within 300 m from the blast zone; Blast monitoring is conducted at the nearest point along the road to the blast zone. It is noted telecommunications cables are generally following the road easement and representative monitoring for both can occur by same monitor.

SSD 8642: All other public infrastructure	All other public infrastructure		MCCO Project Additional Mining Area	N/A (not measured)	50 mm/s *(or a limit determined by the structural design methodology in AS 2187.2-2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Planning Secretary.)*	Periodic monitoring only if required - when within 300 m from the blast zone.
	Notes: [1] *Meaning the Mangoola coal mining area south of Wybong Road* [2] *EPL: A requirement of Mangoola Coal's Environment Protection Licence 12894 as per condition L4.1, L4.2, L4.3 and L4.4, M7.1 and P1.4.* ** As per TransGrid Agreement letter dated 7/09/2015 and TransGrid Agreement letter dated 17/09/2020, refer to* ***Appendix C****.*					

4.2.1 Meteorological Monitoring

Prior to blasting, a review of weather conditions to identify potential conditions that may significantly increase blasting impacts is undertaken by the Blast Controller in accordance with the Mangoola Coal pre-blast environmental assessment process. This information is critical for selecting firing day and time. When pre-blast weather conditions are unsuitable, the Mine Manager, or delegate, will make the decision whether to proceed with the blasting event.

The meteorological station (North) will be operated for the life of mining activities in accordance with Schedule 2, Part B, Condition B35 of SSD 8642. Two meteorological stations (North) and meteorological station (South) will be operated in accordance with Conditions P1.1 and M4.1 of EPL 12894.

The meteorological stations consist of instruments and a data-logging system attached to a 10 metre mast. Logged meteorological parameters include:

- wind speed at 10m above ground;
- wind direction at 10m above ground;
- sigma-theta from sampled wind direction measurements;
- temperature at 2m and 10m above ground;
- solar radiation; and
- rainfall.

4.3 Rock Structure and Rock Shelter Monitoring Program

Rock structure monitoring will be completed to satisfy Schedule 2, Part B, Condition B71 (f) (iii) of SSD 8642 requiring Mangoola Coal to “protect Anvil Hill Rock and “The Book” rock formations from the effects of blasting”.

Rock shelter monitoring will be completed to satisfy Schedule 2, Part B, Condition B68 (c) (iv) of SSD 8642 requiring Mangoola Coal to “protect Aboriginal objects and Aboriginal places located outside of the approved disturbance area from impacts of the development”.

In addition to the blast monitoring identified in ***Table 4.1***, structural condition monitoring of the rock structures and shelters will be completed on a six-monthly basis by a suitably qualified person to monitor for any “damage” of the rock structure and shelters caused by Mangoola Coal blasting operations.

The monitoring methodology involves measuring from fixed monitoring points within the shelter or structure (except where fixed points cannot be attached safely or without causing damage) with digital tape extensometers to measure any movement of the rock mass during the monitoring period. As a result of monitoring being completed since 2008, a robust set of baseline data is available to allow interpretation of any associated changes. Any damage deemed to be caused by Mangoola Coal blasting operations as described above will be reported to DPE as per ***Section 5.5*** of this BMP.

4.4 Blast Impact Evaluation

4.4.1 Property Inspections

As per Schedule 2, Part B, Conditions B16 and B17 of SSD 8642, the following measures must be undertaken by Mangoola Coal within two months (or other timeframe agreed by the Planning Secretary) of receiving a written request for a property inspection to establish the baseline condition of any buildings and structures on the land, or to have a previous property inspection updated from a landowner located within 3 kilometres of the approved open cut pit:

a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to:

   i establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and

   ii identify measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and structures; and

b) give the landowner a copy of the new or updated property inspection report.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or Mangoola Coal or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to Planning Secretary for resolution.

4.4.2 Property Investigations

If any landowner within 3 km of any approved open cut mining pit on the site or any other landowner where the Planning Secretary is satisfied an investigation is warranted, claim in writing that their property may have been damaged as a result of blasting at Mangoola Coal, the investigation process will be triggered as per Schedule 2, Part B, Conditions B18 to B20 of SSD 8642, which requires the following actions to be undertaken within 2 months (or other timeframe agreed by the Planning Secretary) of receiving this request:

a) commissioning of a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to investigate the claim; and

b) give the landowner a copy of the property investigation report

If this independent property investigation confirms the landowner' claim, and both parties agree with these findings, then the Applicant must repair the danage to the satisfaction of the Planning Secretary.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or Mangoola Coal or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Planning Secretary for resolution.

4.4.3 Privately Owned Residences

Blasting activities will be managed so that relevant blasting criteria are met at private residences. To monitor compliance with the criteria provided in ***Table 2.1***, blast monitoring (refer to ***Section 4.2***) will be undertaken at the nearest privately owned residence (subject to land access agreement) or nearest representative location on mine-owned land (as shown in ***Figure 4.1***). It is noted that some properties have acquisition rights (on the basis of predicted noise and/or air quality levels) and should they be acquired, blast monitor/s may be moved to the next nearest privately owned residence subject to approval by the Planning Secretary.

4.4.4 500 kV, 11 kV Transmission Lines, Public Roads, Telecommunication Infrastructure/Cables and other Public Infrastructure

Figure 4.1 shows the TransGrid 500 kV electricity transmission line easement (outside of the western side of the approved disturbance boundary) and the Ausgrid 11 kV electricity transmission line easement (outside of the northern, eastern and southern sides of the approved disturbance boundary, generally running along public roads).

On 22 September 2015 and 18 September 2020 respectively, DPE was notified of the TransGrid Agreements dated 7 September 2015 and 17 September 2020 (refer to ***Appendix C***). These written agreements outline the criteria for ground vibration on the 500kV transmission line towers. The vibration limit for tension pylons is limited to 60 mm/s and the vibration limit for suspension pylons is limited to 150 mm/s. Any changes to these limits will be agreed upon with the infrastructure owner and a copy of this revised agreement submitted to the DPE for approval. This agreement was negotiated for Mangoola Coal Project and is adopted for MCCO Project.

The agreement states that flyrock from blasting operation shall not approach within 60m of the line and any damage to the conductors, insulators, tower structures or line hardware due to the impact of flyrock shall be borne by Mangoola Coal. Excessive quantities of dust in the vicinity of the transmission lines will be avoided to minimise potential damage to insulators.

Mangoola Coal has developed a site procedure to describe the controls to be implemented for the management of blasting activities at Mangoola Coal when blasting adjacent to the 500 kV transmission line.

To monitor compliance with the criteria provided in ***Table 2.1*** for the 11 kV transmission line and public roads (and associated infrastructure), blast monitoring will be undertaken at the closest point to the infrastructure when blasting within a 300 m distance. Environmental Impact Assessment (Umwelt 2019) included Blast Impact Assessment by ESC, which concluded vibration impact no higher than 34 mm/s for a 300 metre distance and a 25 metre bench with a maximum MIC of 1,030 kg. An additional sensitivity study undertaken by Mangoola Coal (2021) confirmed low vibration impact when blasting beyond the 300 metre radius (i.e. vibration no higher than 27 mm/s for a 300 metre distance and a 20 metre bench with a maximum MIC of 778 kg). Both studies confirm that due to vibration impact well below the applicable limit of 100 mm/s (and 50mm/s for other Public Infrastructure in Table 3 of SSD 8642) there is no need for vibration monitoring when blasting beyond 300 m from the infrastructure.

4.4.5 Prescribed Water and Tailings Dams

The requirement to evaluate blasting impacts on prescribed dams has been removed as Mangoola Coal have ceased blasting within the prescribed dam notification areas and extensive backfilling has occurred against the tailings dam 1 and 2 embankments and below the Pit Water Dam. This was confirmed following Mangoola Coal's request (in writing) on 17th November 2020 to the NSW Dam Safety Committee seeking permission to cease the monitoring and reporting requirements under the relevant approvals (Mangoola-3 and Mangoola-4). Following consultation with NSW Dam Safety, the Chief Inspector of Mines, NSW Resources Regulator reviewed and supported the recommendation of the NSW Dam Safety Committee to omit the blast monitoring and reporting requirements. The date of decision was 16th March 2021 as authorised by Anthony Keon (Executive Director, RR, Regional NSW) (Reference: *Mining Act – Variation of approval under a condition, Reasons for a decision*, DOC21/159664).

4.4.6 Rock Formations and Aboriginal Rock Shelters

A number of Aboriginal rock shelters and two rock formations of European heritage significance (referred to as Anvil Rock and 'The Book' rock formation) are located within the Project Area.

SSD 8642, Schedule 2, Condition B11 Blasing Criteria imposes vibration limits for Aboriginal shelters and rock formations (Anvil Rock and 'the Book').

Mangoola Coal undertakes vibration monitoring to ensure the limits are not exceeded. For blasting activities within the Mangoola Coal mining area south of Wybong Road, compliance monitoring will continue to occur at representative locations to 'Anvil Rock' and 'The Book' as well as the closest rock shelter to each blast event.

Relative to the MCCO Project additional mining area (north of Wybong Road), a number of Aboriginal rock shelters are located to the west and south-west from the blasting area (minimum distance being approximately 500 metres). The nearest will be monitored for each blast at a representative location. Other Aboriginal rock shelters, 'Anvil Rock' and 'The Book' are located to the south of Wybong Road and are outside of the MCCO Additional Project Area (in excess of 2 km distance to the blasting area within the MCCO Project additional mining area). For the purpose of compliance monitoring for blast impact evaluation of blasting activities within the MCCO Project additional mining area, vibration monitoring of Anvil Rock and 'the Book' using a single monitoring station will also provide vibration monitoring coverage for the neighbouring rock shelters within the Anvil Hill offset area.

Blast monitoring data from rock formations and rock shelters is used to review blast performance relative to modelled predictions and enable a continual improvement process to be implemented.

Mangoola Coal also undertakes monitoring of Anvil Rock to inform ground vibration impacts at the structure.

Mangoola Coal engages a suitably qualified specialist to conduct 6 monthly structural integrity monitoring of rock formations and rock shelters identified in the HHMP and the ACHMP outlines annual inspections of the Aboriginal Cultural Heritage Offset Areas (including rock shelters within these areas).

4.4.7 Heritage Structures

SSD 8642, Schedule 2, Condition B11 Blasing Criteria imposes vibration limits for the following heritage sites: Yarlett; Wybong Cemetery; Wybong Hall; and Yarraman. These locations are only required to be monitored once blasting activities commence in the MCCO Project Additional Mining Area. Due to the proximity of private residences being monitored in the area, Mangoola Coal utilises these neighbouring private residence monitoring stations as specified in ***Table 4.1*** for this purpose.

In addition, Mangoola Coal undertakes representative monitoring of the Castle Hill site to inform ground vibration impacts to the heritage structure for blasting activities within the Mangoola Coal mining area south of Wybong Road. This is located on a private property and, as documented in the HHMP, access has not been granted to conduct a baseline inspection of the structure. This continues to be offered periodically.

5. Reporting and Review

5.1 Reporting

Reporting conditions for the Mangoola Coal BMP are summarised in ***Table 5.1*** below.

Table 5-1 – Reporting Conditions

Condition	Requirement	Frequency
SSD 8642 Schedule 2 Part D Condition D11	A comprehensive review of blast monitoring results for the corresponding year will be included within Annual Review. This includes an assessment of the blast monitoring results against the blast impact assessment criteria, trends from previous years, EIS predictions, complaints relating to blasting activities and response actions taken. Any new management measures that are implemented as a result of ongoing blast monitoring will also be included in the Annual Review.	Annually
SSD 8642 Schedule 2 Part D Condition D12	Copies of the Annual Review must be submitted to Council and made available to the CCC and any interested person upon request	Annually, or on request
SSD 8642 Schedule 2 Part D Condition D17	A comprehensive summary of blast monitoring results to be made publicly available on the Mangoola Coal website.	Quarterly
NSW Guidelines for establishing a CCC	A summary of environmental monitoring results will be presented at the Mangoola Coal CCC meetings.	Quarterly
EPL 12894 R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.	Any incidents causing or threatening to result in material environmental harm
EPL 12894 R1, R5.1	A summary of blast monitoring points results and complaints for the previous reporting period to be provided within the Annual Return. A summary blast monitoring report for the previous reporting period is to be attached to the Annual Return. This will include, date, time, location of all blast events, monitoring results at each monitor for each event, and an explanation of any missing blast monitoring results.	Annually
EPL 12894 – Section 66(6) POEO Act	A summary of monitoring data to be made publically available on the Mangoola Coal website.	Within 14 days of acquiring previous month's data

5.2 Blasting Notifications

In accordance with Schedule 2, Part B, Condition B21(e) of SSD 8642, Mangoola Coal has established a hotline for landowners and the general public to contact in regards to the blasting schedule and any associated road closure. This hotline is referred to as the Community Response Line and Blasting Hotline (1800 014 339). This hotline is advertised in the local newspaper at least four times per year. In addition, Mangoola Coal has an established register for local landowners/occupiers to whom notification of blasting schedule, and associated road closures and any variations to that schedule, are provided including via SMS message or other messaging format as requested by landowner/occupier.

Surrounding mine operations will be notified by Mangoola Coal prior to scheduled blasts in order to reduce potential for undertaking blasting events simultaneously. Mangoola Coal also receives notification from neighbouring mine operations.

5.3 Complaint Response

Mangoola Coal will maintain a centralised location to record details of relevant external stakeholder communications. A Community Response Line (1800 014 339) will be in operation 24 hours per day, seven days a week and will be regularly advertised in a local newspaper as well as on the Mangoola Coal website. Complaints will be recorded and investigated. Follow up communication with the complainant will be undertaken if requested, to explain the outcome of complaint investigations.

A monthly summary of complaints will be uploaded to the website as per Schedule 2, Part D, Condition D17 of SSD 8642.

5.4 Independent Review

If a landowner considers the operation to be in exceedance of the impact assessment criteria, they may request an independent review of the effects of the operation on their land.

Such a request must be made in writing to the Planning Secretary. If the Planning Secretary determines that an independent review is to be undertaken, Mangoola Coal must follow the procedures outlined in Schedule 2, Part C, Conditions C9 to C11 of SSD 8642.

If the independent review establishes non compliance with the relevant criterion, Mangoola Coal will identify and undertake measures to ensure compliance with the relevant criterion. Mangoola Coal will comply with any written requests made by the Planning Secretary to implement any findings of the review

5.5 Incident and Exceedance Reporting

In accordance with Schedule 2 Part D, Condition D4 of SSD 8642, Mangoola Coal must assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures outlined in development consent SSD 8642.

All reportable incidents will be reported by the E&C Manager in accordance with the PIRMP.

In accordance with Schedule 2 Part D, Condition D9 of SSD 8642 and the PIRMP, Mangoola Coal must notify all relevant authorities including the EPA and DPE of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the POEO Act, for example:

- fume generation: the reporting of fume events is discussed in the Appendix E -Blast Fume Management Procedure
- exceedance of blast specific criteria: all blast overpressures exceeding 120 dBL and ground vibration levels exceeding 10 mm/s recorded at any of the external blast monitors located at private residences shall be reported. Internal investigations will be undertaken when blast overpressures exceed 115 dBL or ground vibration levels exceed 5 mm/s; and
- public safety and infrastructure damage: A blast event that causes damage to public/private infrastructure, poses a risk to safety of people or livestock in the surrounding area.

For all other incidents, exceedance of criteria or performance measures that do not cause threatening material harm to the environment associated with the Project, Mangoola Coal will notify DPE and any other relevant agencies as soon as practicable and no longer than 7 days after Mangoola Coal becomes aware of the incident.

Mangoola Coal will take all reasonable and feasible steps to ensure that the any exceedance ceases and does not recur. Mangoola Coal will consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action.

The notification will be in writing to *compliance@planning.nsw.gov.au* and identify the development (Mangoola Coal Operations (SSD 8642)) and set out the location and nature of the incident or exceedance.

Within seven days of becoming aware of a non-compliance with any of the conditions of SSD 7142, Mangoola Coal must notify DPIE of the non-compliance. The notification must be in writing to compliance@planning.nsw.gov.au and identify the development (Mangoola Coal Operations (SSD 8642)), set out the condition of SSD 8642 that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

5.6 Corrective Action

Table 5.2 summarises the potential blasting related issues that may arise and the appropriate corrective action to be taken.

Table 5-2 - Corrective Actions

Problem	Corrective Action
Single exceedance of environment protection licence/SSD 8642 conditions for airblast overpressure or ground vibration criteria (e.g. 120 dBL and 10 mm/s respectively)	Investigation of exceedance, including the identification and implementation of measures for future blasting where applicable. If validated blast monitoring results identify an exceedance of the impact assessment criteria report exceedance to the EPA and DPE (refer to **Section 5.5)** as required.
Exceedance of 5 per cent per annum criteria for overpressure or ground vibration (e.g. 115 dBL and 5mm/s respectively)	Investigation of exceedance, including the identification and implementation of measures for future blasting where applicable. Report exceedance to EPA and DPE (refer to **Section 5.5**).
Community complaints	Investigation of complaint, including the identification and implementation of measures for future blasting where applicable and provision of feedback to complainant. Monitoring at the complainants residence is to be undertaken where appropriate and considered necessary by Mangoola Coal.

Problem	Corrective Action
Private property damage as a result of blasting operations	Investigation of issue in accordance with SSD 8642 and initiation of property investigations measures detailed in Schedule 2 Part B, Conditions B16 to B20 of SSD 8642 where appropriate.
Incident resulting in, or potential to result in, environmental harm	Reporting, investigation and corrective actions to be implemented in accordance with the Mangoola PIRMP.
Blast results within the 5% allowable exceedance criteria.	Blast design and monitoring results will be reviewed internally with any improvements actioned as required.
Exceedance of limits on TransGrid transmission line pylons.	In liaison with TransGrid or relevant structural specialist, cease blasting events, complete investigation of exceedance and develop mitigation or corrective measures. Report exceedance to DPE (as per **Section 5.5)** as required. Recommencement of blasting under direction of TransGrid, structural specialist and / or government department, as applicable.
Exceedance of limits relevant to 11kV transmission line pylons, public roads, telecommunications cables/infrastructure or other public infrastrucuture.	Investigation of exceedance, including the identification and implementation of measures for future blasting where applicable and, in consultation with infrastructure owner if required. If validated blast monitoring results identify an exceedance of the impact assessment criteria report exceedance to the EPA and DPE (refer to **Section 5.5)** as required.
Exceedance of applicable limits for nearest Aboriginal Rock Shelter Site/s to a blast event or rock formations “Anvil Rock” or “The Book”	Investigation of exceedance, including the identification and implementation of measures for future blasting where applicable. If validated blast monitoring results identify an exceedance of the impact assessment criteria, report exceedance to appropriate authorities as required (as per **Section 5.5).**
Exceedance of applicable limits for infrastructure or historic heritage sites	Investigation of exceedance, including the identification and implementation of measures for future blasting where applicable. If validated blast monitoring results identify an exceedance of the impact assessment criteria, report exceedance to appropriate authorities/landholders as required (as per **Section 5.5).**

5.7 Records

In accordance with Condition M1.2 of EPL 12894, monitoring records will be maintained on site for at least four years.

5.8 Review

In accordance with Schedule 2 Part D, Condition D7 of SSD 8642 Mangoola Coal will review and where necessary revise the BMP within 3 months of the submission of an incident report, Annual Review, Independent Environmental Audit, or the approval of any modification to the conditions of the SSD 8642 Consent (unless the conditions require otherwise), or notification of a change in development phase. The BMP will further be subject to a 3 year periodic review. The review of the BMP will reflect changes in environmental requirements, technology and operational procedures. In addition, the document review table is to be completed as part of each review (refer to Revision History Table as cover page).

6. References

- Australian Explosives Industry and Safety Group Inc. (AEISG) Code of Practice - Prevention and Management of Blast Generated NOx Gases in Surface Blasting, Edition 2, August 2011.
- Australian and New Zealand Environment and Conservation Council (ANZECC) (1990). Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration. ANZECC, Canberra.
- Australian Standard AS 2187.2-2006, Explosives – Storage and use, Part 2 – Use of explosives (AS 2187 Part 2), 2006.
- B. Fraser, 10th December 2010, Mangoola Mine Blast Vibration Limits – TransGrid 5A3/5A4 500kV Transmission Line. TransGrid – Letter.
- Blasting Impact Assessment (ESC 2019) (Prepared for EIS – Umwelt 2019, Appendix 10); https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8642%2120190705T022046.918%20GMT.
- Environmental Impact Statement (EIS – Umwelt 2019); https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-8642%2120190705T033108.361%20GMT.
- Environmental Planning and Assessment Act 1979 (No 203) (EP&A Act) (NSW).
- Environmental Planning and Assessment Amendment Regulation 2010 (NSW).
- EPL 12894. NSW Environment Protection Authority, 7 July 2008 (as varied). Environmental Protection Licence EPL 12894
- EMGA Mitchell McLennan (2013). Mangoola Coal Modification 6 Environmental Assessment. Report prepared for Xstrata Mangoola Pty Limited.
- Mangoola Open Cut Pty Limited as updated from time to time:
    - i Blast Fume Management Procedure
    - ii Blast Monitoring Procedure for TransGrid Powerlines.
    - iii Pre-Blast Environmental Assessment Procedure.
    - iv Road Closure Management Plan.
- Moore, A.J. and Howarth, P. (2013). Xstrata Mangoola Coal – NSW: Baseline Measurement of Aboriginal and European Cultural Heritage Sites 2008 – 2012. Terrock Consulting Engineers, Eltham Victoria.
- Moore, A.J. and Richards, J. (2018). Glencore Mangoola Coal: Review of Blast Vibration Limit for Mangoola Heritage Rock formations 2017. Terrock Consulting Engineers, Eltham Victoria.
- NSW Dams Safety Act 2015 No 26
- NSW Department of Environment and Conservation (2007). Approved methods for the sampling and analysis of air pollutants in NSW. Department of Environment and Conservation, Sydney.
- SSD 8642. Development Consent SSD 8642, dated 26.04.21.
- Letter (2012): Blast Fume Management Strategy. Department of Planning and Infrastructure. Chris Wilson and Scott Brooks.

- Letter (2015) TransGrid Agreement. Blast Vibration Limits – TransGrid 5A3/5A4 500kV Transmission Line. TransGrid. Warren Barat.
- Letter (2020) TransGrid Agreement. Mangoola Coal Project – Increase the blasting vibration limits on TransGrid Towers. TransGrid. John Psarologos.
- Letter (2020) Mangoola Coal letter to NSW Dam Safety Committee requesting cessation of MANGOOLA-3 and MANGOOLA-4 blast monitoring and reporting requirments4. Technical Service Manager, Mark Williams. (Autorised by Exectutive Director Anthony Keon, Resources Regulator, Regional NSW on 16 March 2021, Document Ref:DOC21/159664)

Appendix A - Statement of Commitments – Mangoola Coal Continued Operations

Hours of Operation

- as per the existing operation, mining and associated activities for the MCCO Project will be undertaken 24 hours per day, 7 days per week
- as per the existing operation, blasting will be undertaken 9.00 am to 5.00 pm on Monday to Saturday, with no blasting to be undertaken on Sundays or public holidays without written approval of the EPA

Blasting

- Mangoola will manage blasting for the MCCO Project to maintain the existing blasting frequency and timing limits. That is, no more than six blast events per week or two blast events per day between the hours of 9.00 am and 5.00 pm Monday to Saturday, with an allowance for additional blasts where there are low vibration blasts, misfires or where blasts are required to ensure the safety of the mine or its workers
- Mangoola will implement the appropriate blast design controls necessary to meet the relevant criteria for private residential receivers, heritage items, rock formations and infrastructure
- Mangoola will design its blasting practices in a manner that will, as far as reasonably practicable:
  - protect the health and safety of people
  - protect property, public infrastructure and livestock
  - minimise dust and fume emissions
  - minimise the frequency and duration of any road closures for blasting, and use all reasonable efforts to avoid road closures during peak traffic periods
  - carry out blast monitoring to confirm the Project is complying with the relevant conditions of the development consent
- Mangoola will review and update the existing Blast Management Plan and then implement the updated plan for the MCCO Project. The Blast Management Plan will include an updated pre-blast assessment protocol that outlines the process for designing blasts to meet the relevant criteria
- the existing multi-station blast monitoring system for Mangoola Coal Mine will continue to be used. This will also be reviewed and revised as required to cover the sensitive receivers located in the vicinity of the MCCO Additional Project Area. In this regard the following locations for monitoring will be considered, subject to access arrangements:
  - north direction – residential receiver 66 or the closest to it
  - east direction – residential receiver 154, or the closest to it
  - south direction – residential receiver 83 or the closest to it
  - north-west direction – residential receiver 139 or 157 or closest to them
- Mangoola will review and update the existing Road Closure Protocol to include potential interactions with Wybong Road, Wybong Post Office Road and Ridgelands Road due to mining in the MCCO Additional Project Area in consultation with MSC. The updated Road Closure Protocol will be implemented
- blasting related closures of public roads associated with the MCCO Project will be limited to a maximum of one closure event per day (noting that more than one road may need to be closed during a closure event)
- Mangoola will offer all private landholders located within 2 km of the MCCO Proposed Additional Mining Area a property inspection prior to the commencement of blasting in the MCCO Additional Project Area to establish the baseline condition of private structures.

Appendix B - Approvals Summary

Table B-1- EPL Conditions

<table>
<tr><th>Condition Number</th><th>Condition</th><th>Section of Document</th></tr>
<tr><td>P1.4</td><td>The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or setting of limits for the emission of noise from the point.

Noise

<table>
<tr><th>EPA identi-fication no.</th><th>Type of monitoring point</th><th>Location Description</th></tr>
<tr><td>16</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Defined as "Monitoring Point 16 in plan titled "Mangoola Coal EPL 12894 - HRSTS discharge point, air quality, blast, surface water and groundwater monitoring locations" dated 2/10/2018. EPA Reference Doc18/739986</td></tr>
<tr><td>21</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Defined as "Monitoring Point 21 in plan titled "Mangoola Coal EPL 12894 - HRSTS discharge point, air quality, blast, surface water and groundwater monitoring locations" dated 2/10/2018. EPA Reference Doc18/739986</td></tr>
<tr><td>32</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Defined as "Monitoring Point 32 in plan titled "Mangoola Coal EPL 12894 - HRSTS discharge point, air quality, blast, surface water and groundwater monitoring locations" dated 2/10/2018. EPA Reference Doc18/739986</td></tr>
</table>
</td><td>4.2</td></tr>
<tr><td>L4.1</td><td>The airblast overpressure level from blasting operations in or on the premises must not exceed: 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 16, 21 or 32 in Condition P1.4.</td><td>2; 4.2</td></tr>
<tr><td>L4.2</td><td>The airblast overpressure level from blasting operations in or on the premises must not exceed: 120 dB (Lin Peak) at any time; at either monitoring point 16, 21 or 32 in Condition P1.4.</td><td>2; 4.2</td></tr>
</table>

Condition Number	Condition	Section of Document
L4.3	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 5 mm/second for more than 5% of the total number of blasts during each reporting period; at either monitoring point 16, 21 or 32 in Condition P1.4.	**2; 4.2**
L4.4	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 10 mm/second at any time; at either monitoring point 16, 21 or 32 in Condition P1.4.	**2; 4.2**
L4.5	Blasting in or on the premises must only be carried out between 09:00 hours and 17:00 hours, Monday to Saturday. Blasting in or on the premises must not take place on Sundays or Public Holidays without the prior approval of the EPA.	**2; 4.2**
L4.6	Offensive blast fume must not be emitted from the premises. Definition: *Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances:* 1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or 2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.	**2; 4.2, Appendix A, Appendix E**
M7.1	To determine compliance with conditions L4.1, L4.2, L4.3 and L4.4: a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring points 16, 21 or 32 for the parameters specified in Column 1 of the table below; and b) The licensee must use the units of measure, sampling method, and sample at the frequency specified opposite in the other columns.	**4.1; 4.2**
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.	**5.1**
R4.1	**Reporting of Blast Monitoring** The licensee must supply, with each Annual Return, a Blast Monitoring Report which must include the following information relating to each blast carried out within the premises during the reporting period covered by the Annual Return: a) the date and time of the blast; b) the location of the blast on the premises; c) the blast monitoring results at each blast monitoring station; and d) an explanation for any missing blast monitoring results.	**5.1**

Condition Number	Condition	Section of Document
R4.2	**Reporting exceedance of blasting limits** The licensee must report any exceedance of the licence blasting limits to the Environment Line on 131 555 as soon as practicable after the exceedance becomes known to the licensee or to one of the licensee's employees or agents.	**5.5**

Table B-2 - Development Consent Conditions (SSD 8642)

<table>
<tr><th colspan="3">MCCO Project (SSD 8642 Conditions)</th></tr>
<tr><th>Condition No.</th><th>Condition</th><th>Section of Document</th></tr>
<tr><td>Schedule 2
Condition A3</td><td>TERMS OF CONSENT

Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to:
(a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary; and
(b) the implementation of any actions or measures contained in any such document referred to in condition A3(a).</td><td>Entire Document</td></tr>
<tr><td>Schedule 2
Condition B11</td><td>Blasting Criteria

The Applicant must ensure that blasting on the site does not cause exceedances of the criteria at the locations in Table 3.

Table 3: Blasting Criteria
<table>
<tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr>
<tr><td rowspan="2">Residence on privately-owned land</td><td>120</td><td>10</td><td>0%</td></tr>
<tr><td>115</td><td>5</td><td>5% of the total number of blasts over a calendar year</td></tr>
<tr><td>Yarlett[a]
Wybong Cemetery[a]
Wybong Hall[a]
Yarraman[a]</td><td>133</td><td>5</td><td>0%</td></tr>
<tr><td>Anvil Rock[a]
The Book[a]</td><td>-</td><td>50</td><td>0%</td></tr>
<tr><td>Aboriginal Rock Shelter Sites[a]</td><td>-</td><td>50</td><td>0%</td></tr>
<tr><td>500kV transmission line pylons – tension towers</td><td>-</td><td>50</td><td>0%</td></tr>
<tr><td>500kV transmission line pylons – suspension towers
11 kV transmission line – timber poles</td><td>-</td><td>100</td><td>0%</td></tr>
<tr><td>Prescribed Water Dams</td><td>-</td><td>50</td><td>0%</td></tr>
<tr><td>Prescribed Tailings Dams</td><td>-</td><td>100</td><td>0%</td></tr>
<tr><td>Public Roads, Telecommunication infrastructure and cables</td><td></td><td>100</td><td>0%</td></tr>
<tr><td>All other public infrastructure</td><td></td><td>50 (or a limit determined by the structural design methodology in AS 2187.2 - 2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Planning Secretary)</td><td>0%</td></tr>
</table></td><td>Section 2</td></tr>
<tr><td>Schedule 2
Condition B12</td><td>The blasting criteria in Table 3 do not apply if the Applicant has an agreement with the owners of the relevant residence or infrastructure to exceed the blasting criteria, and the Applicant has advised the Department in writing of the terms of this agreement.</td><td>Section 2</td></tr>
<tr><td>Schedule 2
Condition B13</td><td>Blasting Hours

The Applicant must only carry out blasting on site between 9 am and 5pm (Monday to Saturday inclusive). No blasting is allowed on Sundays, public holidays, or at any other time without the prior written approval of the Planning Secretary.</td><td>Section 2</td></tr>
</table>

MCCO Project (SSD 8642 Conditions)		
Condition No.	**Condition**	**Section of Document**
Schedule 2 Condition B14	**Blasting Frequency** The Applicant may carry out a maximum of: (a) 2 single blast events[a] a day; and (b) 6 single blast events[a] a week, averaged over a calendar year.	**Section 2**
Schedule 2 Condition B15	Condition B14 does not apply to single blast events[a] that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or blasts misfires or blasts required to ensure the safety of the mine, its workers or the general public. *[a] Within conditions B14 and B15, 'single blast event' means a blast which involves either a single detonation or a number of individual blasts fired in quick succession in a discrete area of the development. Should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast event.*	**Section 2**
Schedule 2 Condition B16	**Property Inspections** If the Applicant receives a written request from the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on the site for a property inspection to establish the baseline condition of any buildings and structures on their land, or to have a previous property inspection updated, then within 2 months of receiving this request, or other timeframe agreed by the Planning Secretary, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to: (i) establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and (ii) identify measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and structures; and (b) give the landowner a copy of the new or updated property inspection report.	**Section 4.4.1**
Schedule 2 Condition B17	If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to the Planning Secretary for resolution.	**Section 4.4.1**
Schedule 2 Condition B18	**Property Investigations** If the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on the site or any other landowner where the Planning Secretary is satisfied an investigation is warranted, claims in writing that buildings or structures on their land have been damaged as a result of blasting on the site, then within 2 months of receiving this written claim, or other timeframe agreed by the Planning Secretary, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to investigate the claim; and (b) give the landowner a copy of the property investigation report.	**Section 4.4.2**
Schedule 2 Condition B19	If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant must repair the damage to the satisfaction of the Planning Secretary.	**Section 4.4.2**
Schedule 2 Condition B20	If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Planning Secretary for resolution.	**Section 4.4.2**

MCCO Project (SSD 8642 Conditions)		
Condition No.	**Condition**	**Section of Document**
Schedule 2 Condition B21	**Blast Operating Conditions** The Applicant must: (a) take all reasonable steps to: (i) ensure the safety of people and livestock from blasting impacts of the development; (ii) protect public or private infrastructure and property in the vicinity of the site from blasting damage associated with the development; and (iii) minimise blast-related dust and fume emissions; (b) ensure that blasting on the site does not result in greater impacts to heritage items[a] than those predicted in the document/s listed in condition A2(c), and develop specific measures to protect heritage items from any blasting damage associated with the development; (c) operate a comprehensive blast management system that uses a combination of meteorological forecasts and predictive blast modelling to guide the planning of blasts to minimise blasting impacts; (d) minimise the frequency and duration of any public road closures for blasting; and use all reasonable efforts to avoid road closures during peak traffic periods; (e) operate a suitable system to enable interested members of the public to get up-to-date information on the proposed blasting schedule on site and any associated road closures, including notification via SMS message of the blasting schedule and associated road closures for that day and any variations to that schedule and closures; (f) use all reasonable efforts to co-ordinate the timing of blasting at the site with any nearby mines to minimise cumulative blasting impacts; and (g) carry out regular blast monitoring to determine whether the development is complying with the relevant conditions of this consent. *[a] The locations of the heritage items referred to in paragraph (b) are shown in Appendix 7.*	**Sections 2; 3.2; 3.3; 3.4; 4.2** **Appendix A** **Appendix D** **Appendix E**
Schedule 2 Condition B22	The Applicant must not undertake blasting on the site within 500 metres of any public road or any land outside the site not owned by the Applicant, unless the Applicant has: (a) a written agreement with the relevant infrastructure owner or landowner to allow blasting to be carried out closer to the public road or land, and the Applicant has advised the Department in writing of the terms of this agreement; or (b) demonstrated to the satisfaction of the Planning Secretary, that the blasting can be carried out closer to the public road or land without compromising the safety of people or livestock or damaging the road or other buildings and structures, and updated the Blast Management Plan to include specific mitigation measures to be implemented while blasting is being carried out within 500 metres of the road or land.	**Section 3.2.1** **Appendix D**

MCCO Project (SSD 8642 Conditions)		
Condition No.	**Condition**	**Section of Document**
Schedule 2 Condition B23	**Blast Management Plan** The Applicant must prepare a Blast Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by a suitable qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary (b) describe the blast management system and the measures that will be implemented to ensure compliance with the blasting criteria and conditions of this consent; (c) include a Blast Fume Management Strategy for: (i) minimising blast fume emissions; (ii) rating and recording blast fume events; and (iii) reporting significant blast fume events to the Department and the EPA; (d) include a Road Closure Management Plan for any blasting within 500 metres of a public road, that has been prepared in consultation with relevant roads authorities and includes provision for: (i) minimising the duration of closures, both on a per event basis and weekly basis; (ii) avoiding peak traffic periods as far as reasonable; and (iii) co-ordinating closures with nearby mines to minimise the cumulative effect of road closures; (e) identify any agreed alternative ground vibration limits for public or private infrastructure in the vicinity of the site (if relevant); (f) include a strategy to monitor, mitigate and manage the effects of blasting on heritage items, particularly those identified in Appendix 7, including details of baseline (i.e. pre-blasting) and ongoing risk-based dilapidation surveys (subject to landowner access arrangements); (g) include a monitoring program for evaluating and reporting on compliance with the relevant conditions of this consent; (h) include a protocol for identifying any blast-related exceedance, incident or non0-compliance and for notifying the Department, the EPA and relevant stakeholders of these events; (i) include public notification procedures to enable members of the public, particularly surrounding residents, to get-up-to-date information on the proposed blasting schedule; and (j) include a protocol for investigating and responding to blast-related complaints.	**Sections 2; 3; 4; 5** **Appendix D** **Appendix E** **Historic Heritage Management Plan**
Schedule 2 Condition B24	The Applicant must not undertake any blasting north of Wybong Road until the Blast Management Plan is approved by the Planning Secretary.	**Section 1.2** **Appendix F**
Schedule 2 Condition B25	The Applicant must implement the Blast Management Plan as approved by the Planning Secretary.	
Schedule 2 Condition B35	**METEOROLOGICAL MONITOIRNG** Prior to the commencement of construction and for the life of the development, the Applicant must ensure that there is at least one suitable meteorological station operating in the vicinity of the site that: (a) complies with the requirements in the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* (DEC. 2007); and (b) is capable of measuring meteorological conditions in accordance with the NSW Noise Policy for Industry (EPA, 2017), unless a suitable alternative is approved by the Planning Secretary following consultation with the EPA.	**Section 4.2.1**

MCCO Project (SSD 8642 Conditions)		
Condition No.	**Condition**	**Section of Document**
Schedule 2 Condition B71	**Historic Heritage Management Plan** The Applicant must prepare a Historic Management Plan for the development, in respect of non-Aboriginal cultural heritage items, to the satisfaction of the Planning Secretary. This strategy must: (a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary; (b) be prepared in consultation with the Heritage NSW, Council and the relevant landowners and in accordance with the relevant Heritage NSW guidelines; (c) build upon the approved Conservation Management Strategy prepared for the Mangoola Coal Project; (d) describe how historic heritage values of the site would be recorded and preserved; (e) identify all heritage items in the vicinity of the site and include a statement of significance for each item; (f) describe the measures to be implemented on the site or within any offset areas to: (i) ensure all workers on the site receive suitable heritage inductions prior to carrying out any activities which may cause impacts to historic heritage, and that suitable records are kept of these inductions: (ii) protect heritage items located outside the approved disturbance area [particularly 'Castle Hill', from impacts of the development, beyond those predicted in the document/s listed in conditions A2(c); (iii) protect Anvil Hill Rock and 'The Book' rock formations from the effects of blasting; (iv) undertake photographic/archival recording of any items of heritage significance predicted to be impacted by the development, prior to disturbance; and (v) manage any new heritage items discovered during the life of the development; (g) include a program to monitor the effects of blasting on the heritage items; and (h) include a strategy for the care, control and storage of heritage relics salvaged from the site.	**Sections 4.3; 4.4.6; 4.4.7** **Historic Heritage Management Plan**
Schedule 2 Condition B72	**Note:** Identified heritage items are shown in the figures in Appendix 7. The Applicant must not commence mining operations north of Wybong Road until the Historic Management Plan is approved by the Planning Secretary.	
Schedule 2 Condition B73	The Applicant must implement the Historic Heritage Management Plan as approved by the Planning Secretary.	
Schedule 2 Condition C7	**NOTIFICATION OF EXCEEDANCES** As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any noise, blasting or air quality criterion in PART B of this consent, the Applicant must provide the details of the exceedance to any affected landowners, tenants and the CCC.	**Section 5.5**
Schedule 2 Condition C9	**INDEPENDENT REVIEW** If a landowner considers the development to be exceeding any relevant noise, blasting or air quality criterion in PART B of this consent, they may ask the Planning Secretary in writing for an independent review of the impacts of the development on their residence or land.	**Section 5.4**
Schedule 2 Condition C10	If the Planning Secretary is not satisfied that an independent review is warranted, the Planning Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.	

MCCO Project (SSD 8642 Conditions)		
Condition No.	**Condition**	**Section of Document**
Schedule 2 Condition C11	If the Planning Secretary is satisfied that an independent review is warranted, within 3 months of the Planning Secretary's decision, or other timeframe agreed by the Planning Secretary, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to: (i) consult with the landowner to determine their concerns; (ii) conduct monitoring to determine whether the development is complying with the relevant criteria in PART B of this consent; and (iii) if the development is not complying with the relevant criterion, identify measures that could be implemented to ensure compliance with the relevant criterion; and (b) give the Planning Secretary and landowner a copy of the independent review; and (c) comply with any written requests made by the Planning Secretary to implement any findings of the review.	
Schedule 2 Condition C12	**LAND AQUISITION** Within 3 months of receiving a written request for acquisition from a landowner with acquisition rights, the Applicant must make a binding written offer to the landowner based on: (a) the current market value of the landowner's interest in the land at the date of this written request, as if the land was unaffected by the development, having regard to the: (i) existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and (ii) presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the additional noise and/or air quality mitigation measures in condition C2; (b) the reasonable costs associated with: (i) relocation within the Muswellbrook local government area, or to any other local government area agreed to by the Planning Secretary; and (ii) obtaining independent legal advice and expert advice for determining the acquisition price of the land; and the terms upon which it is to be acquired; and (b) reasonable compensation for any disturbance caused by the land acquisition process.	**Section 5.4**
Schedule 2 Condition C13	If, within two months of the binding written offer being made under condition C12, the Applicant and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Planning Secretary for resolution.	**Section 5.4**
Schedule 2 Condition C14	Upon receiving a request, under condition C13, the Planning Secretary will request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to: (a) consider submission from both parties; (b) determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in condition C12. (c) prepare a detailed report setting out the reasons for any determination; and (d) provide a copy of the report to both parties.	**Section 5.4**

MCCO Project (SSD 8642 Conditions)		
Condition No.	**Condition**	**Section of Document**
Schedule 2 Condition C15	Within 14 days of receiving the independent valuer's report. The Applicant must make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination.	**Section 5.4**
Schedule 2 Condition C16	However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, either party may refer the matter to the Planning Secretary for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Planning Secretary will determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in condition C12, the independent valuer's report, the detailed report of the party that disputes the independent valuer's determination and any other relevant submissions.	**Section 5.4**
Schedule 2 Condition C17	Within 14 days of this determination, the Applicant must make a binding written offer to the landowner to purchase the land at a price not less than the Planning Secretary's determination.	**Section 5.4**
Schedule 2 Condition C18	If the landowner effuses to accept the Applicant's binding written offer under this condition within 6 months of the offer being made, then the Applicant's obligations to acquire the land shall cease, unless the Planning Secretary determines otherwise.	**Section 5.4**
Schedule 2 Condition C19	The Applicant must pay all reasonable costs associated with the land acquisition process described in conditions C12 to C18 inclusive, including the costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of this plan at the Office of Registrar-General.	**Section 5.4**
Schedule 2 Condition D4	**Adaptive Management** The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and performance measures in this consent. Any exceedance of these criteria of performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation. Where any exceedance of these criteria or performance measures has occurred, the Applicant must, at the earliest opportunity: (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur; (b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and (c) implement reasonable remediation measures as directed by the Planning Secretary.	**Sections** **3; 3.1; 3.2; 4; 4.2; 5.5; 5.6**

MCCO Project (SSD 8642 Conditions)		
Condition No.	**Condition**	**Section of Document**
Schedule 2, Condition D5	**Management Plan Requirements** Management plans required under this consent must be prepared in accordance with relevant guidelines; and include: (a) summary of relevant background or baseline data; (b) details of: (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits of performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; (c) any relevant commitments or recommendations identified in the documents listed in condition A2(c); (d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria; (e) a program to monitor and report on the: (i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to condition D4(c); (f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible; (g) a program to investigate and implement ways to improve the environmental performance of the development over time; (h) a protocol for managing and reporting any: (i) incident; non-compliance or exceedance of any impact assessment criterion or performance criterion; (ii) complaint; or (iii) failure to comply with other statutory requirements; (i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and (j) a protocol for periodic review of the plan. ***Note**: The Planning Secretary may wave some of these requirements if they are unnecessary or unwarranted for particular management plans.*	**Sections 1.4; 1.5; 2; 3; 4; 5**
Schedule 2 Condition D6	The Applicant must ensure that management plans prepared for the development are consistent with the conditions of this consent and any EPL issued for the site.	

Appendix C - 500 kV Transmission Line

Planning & Assessment
Resource Assessments
Contact: Joe Fittell
Phone: 02 4908 6896
Email: joe.fittell@planning.nsw.gov.au

Mr Nathan Lane
Environment and Community Manager
Mangoola Coal Operations Pty Limited
Muswellbrook NSW 2333

06/10/2020

Dear Mr Lane

Mangoola Coal Project (PA 06_0014)
Approval of Updated Blast Management Plan

I refer to the Blast Management Plan which was updated to reflect the blasting vibration limit for suspension towers as per TransGrid Agreement (dated 17 September 2020) and submitted in accordance with condition 10, Schedule 3 of the Mangoola Coal Project development consent (PA 06_0014).

The Department has carefully reviewed the document and is satisfied that it meets the requirements of the Project development consent.

Accordingly, the Planning Secretary has approved the updated Blast Management Plan (version 18, dated September 2020). Please ensure that the approved plan is placed on the project website at your earliest convenience.

If you wish to discuss the matter further, please contact Joe Fittell at the details above.

Yours sincerely,

Matthew Sprott
Director
Resource Assessments (Coal & Quarries)

As nominee of the Planning Secretary

TransGrid

ABN 19 622 755 774
180 Thomas Street, Sydney
PO Box A1000 Sydney South
NSW 1235 Australia
T (02) 9284 3000
F (02) 9284 3456

7/09/2015

Technical Service Manager

Mangoola Coal Operations Pty Ltd
PO Box 495
MUSWELLBROOK NSW 2333

Attention: Mr. M Williams

Dear Mark

Mangoola Mine

BLAST VIBRATION LIMITS – TRANSGRID 5A3/5A4 500kV TRANSMISSION LINE

We refer to your recent correspondence requesting approval to increase the limits for blasting in the vicinity of TransGrid 5A3/5A4 500kV Transmission Line.

TransGrid will not object to an increase in the limits for the blasting, provided Mangoola Mines executes and returns the acknowledgement (attached) reflecting its intention to adhere to the following requirements:

1. **Design Limits** – peak particle velocity (ppv)

Mangoola Coal shall design its blasting operations such that:

1.1 The ppv for the suspension towers will not exceed 125mm/sec (Note 1).

1.2 The ppv for the tension towers will not exceed 60mm/sec (Note 2).

1.3 Fly-rock is not to approach within 60m of the line.

1.4 Generation of excessive dust in the vicinity of the transmission line shall be avoided.

2. **Non-Destructive Tests** (NDT)

Mangoola Coal shall undertake, at its own cost, a non-destructive testing programme and methodology agreed by TransGrid of the tower footings that will be affected by the blasting, as follows:

2.1 Prior to the commencement of the blasting operations that will affect the towers, NDT "baseline measurements" shall be obtained for each affected tower.

2.2 During the mine's blasting operations, any tower subject to a ppv in excess of the above limits (refer to items 1.1 and 1.2) shall have additional NDT performed.

2.3 At the conclusion of the mine's operations in the vicinity of the Transmission Line, NDT on all affected towers shall be performed.

The NDT, and analysis of the results, shall be undertaken by an independent third party consultant engaged by Mangoola Coal, and agreed to by TransGrid.

3. Monitoring Programme

Mangoola Coal shall undertake, at its own cost, a monitoring programme, agreed to by TransGrid, as follows:

3.1 All towers that will be affected during the blasting operations shall be monitored during the blasting.

3.2 Prior to the commencement of blasting, an email shall be sent to TransGrid detailing the predicted ppv of the blasting on each of the TransGrid towers being monitored.

3.3 Subsequent to each blasting operation, the ppv measurements for each monitored tower shall be forwarded by email to TransGrid, highlighting any exceedances of the predicted ppv and or limits.

3.4 If the ppv measured exceeds the limits specified above (refer to 1.1 and 1.2), the blasting operations shall cease until TransGrid is consulted and agrees to the recommencement of blasting operations.

The monitoring and analysis of the ppv results shall be undertaken using methodology agreed to by TransGrid.

4. Remedial Costs

Mangoola Coal shall agree to meet the full costs of rectifying any damage to TransGrid assets as follows:

4.1 Any footing found to be damaged by the blasting as determined by the non-destructive tests.

4.2 Damage to the conductors, insulators, tower structures, or line hardware due to the impact of fly rock.

4.3 Damage and/or upgrading of insulation levels due to excessive dust generation.

5. General Conditions for Working in the Vicinity of TransGrid Assets

Work associated with the mine's operation within 60 metres of the transmission line shall be undertaken in accordance with "WorkCover NSW Guidelines – Work Near Overhead Power lines Code of Practice". This Code requires approved work practices as well as prior consultation with TransGrid.

Notes

Note 1 – Based on work undertaken by Terrock Consulting Engineers and testing carried out by Mangoola Coal.

Note 2 – TransGrid imposes a lower ppv limit for tension towers than suspension towers. The lower limit for tension towers relates not only to their criticality in the overall line design, but more importantly to the difficulties in rectifying any footing damage due to the significant permanent loads acting on these structures.

TransGrid has considered increasing the permitted (ppv) blasting limit only for TL5A3/5A4 line based on the recent testing and inspection of tower footings on TL5A3/5A4, where ppv levels were recorded at the tower footings of up to 117mm/sec. There is no evidence (through measurement) that footing have safely endured ppv levels greater than this.

In relation to the option of further increasing the permitted blasting limits in the future, it is advised that TransGrid would only consider requests on a case by case basis, to be determined by site specific conditions and supported by extensive testing and investigations as was the case in this instance. TransGrid must be satisfied the proposed increase will not pose potential risks to TransGrid's infrastructure.

If you have any further questions regarding this matter, please do not hesitate to contact Jennifer Sai on (02) 9284 3523.

Yours sincerely

Warren Barat
Manager Customer Engagement

TransGrid

Please sign and return this page only to TransGrid
(c/o Jennifer Sai at PO Box A1000 Sydney South NSW 1235)

Mangoola Coal Operations Pty Ltd acknowledges TransGrid's conditional approval for the increase the limits for blasting in the vicinity of TransGrid 5A3/5A4 500kV Transmission Line as expressed in TransGrid's letter to Mangoola Coal Operations Pty Ltd dated 3 September 2015 ("increased blasting limit conditions").

Mangoola Coal Operations Pty Ltd undertakes to adhere to the increased blasting limit conditions and agrees TransGrid may, if Mangoola Coal Operations Pty Ltd departs from the increased blasting limit conditions:

1. Withdraw its approval; and
2. Seek recovery of costs for damages.

Executed by **Mangoola Coal Operations Pty Limited** by its authorised representative:

Signature of witness	Signature of authorised representative
MARK WILLIAMS	Tony Israel
Print name	Print name
17/11/15.	17.11.15.
Date	Date

TransGrid
Infrastructure

ABN 94 121 353 950
180 Thomas Street, Sydney
PO Box A1000 Sydney South
NSW 1235 Australia
T (02) 9284 3000
F (02) 9284 3456

17 September 2020

Brian Pease
Glencore Coal (NSW) Pty Limited
Wybong Road, Muswellbrook NSW 2033

Dear Brian,

Mangoola Coal Projects –Increase the blasting vibration limit on TransGrid Towers

We refer to the correspondence dated 23 March 2020, Mangoola Coal Operations Pty Limited (Mangoola Coal) requested TransGrid to:

1. Review if the ground vibration limit of the suspension and tension towers should be increased i.e. to extend to the peak particle velocity limit from 125 mm/s (agreed in November 2015) at all suspension towers to a limit of 200 mm/s and an increase from the 60 mm/s (agreed in November 2015) at all tension towers to 100 mm/s.
2. Review if monitoring of the tower footings can be replaced by in ground monitoring of the closest tower(s) only.

Adjacent to the mining operations is a TransGrid owned 500kV double circuit transmission line 5A3/5A4 and below key points were considered while evaluating the above request.

1. Instrumentation and monitoring is being undertaken in accordance with the Blast Management Plan and the requirements imposed by TransGrid to Mangoola Mine (refer 7/09/2015 letter).
2. No blasts have exceeded the allowable ground vibration limits of the tension towers.
3. A single exceedance of the allowable ground vibration limits of the suspension towers (Tower 68X).
4. Terrock's recommendation is for the design limit of 150 mm/s be implemented for suspension towers but that any increase to 200 mm/s would be based on further analysis and consultation with TransGrid.
5. The strain investigation and measurement results are considered limited and varied. More strain data is needed at higher levels of vibration to be able to determine the effects of blasting on the footings and to develop higher safe limits of vibration confidently.

Conclusion:

Based on the above criteria, TransGrid accepts Mangoola Coal's proposal to increase the allowable vibration limits of the suspension towers to 150 mm/s, subject to the continued adherence to the requirements imposed by TransGrid to Mangoola Mine (refer 7/09/2015 letter).

It is to be noted that allowable vibration limits on the tension towers remain unchanged as stated in TransGrid letter dated 07/09/15

Lastly, TransGrid accepts Mangoola Coal's proposal to substitute the footing monitoring points with ground vibration monitoring points on the proviso that the monitoring points are placed adjacent to each of the closest two footings rather than in between. TransGrid does not have any objection to the use of ground monitoring points at each of the two closest footings, however, the ground monitoring points should be located within 2 m of the footing but not directly adjacent to the footings.

For any clarifications, please contact me on (02) 9284 3441 or john.psarologos@transgrid.com.au.

Yours sincerely

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Appendix D - Road Closure Management Plan

This Road Closure Management Plan (former name 'Mangoola Mining procedure – Closing Public Roads') is available on the Mangoola Coal website –

https://www.glencore.com.au/operations-and-projects/coal/current-operations/mangoola-open-cut/management-plans

Appendix E - Blast Fume Management Procedure

The Blast Fume Management Procedure is published on the Mangoola Coal website -

https://www.glencore.com.au/operations-and-projects/coal/current-operations/mangoola-open-cut/management-plans

Appendix F - Authority Correspondence