Rasp Mine

Zinc – Lead – Silver Project

Project Approval No. 07-0018 SSD-014

Statement of Environmental Effects

Modification MOD7

Utilising Rock Fill Material in BHP Pit for TSF2 Embankment Construction

June 2019

Broken Hill Operations Pty Ltd

BROKEN HILL

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SUBMISSION OF ENVIRONMENTAL ASSESSMENT

This Statement of Environmental Effects (SEE) is prepared as required for a State Designated Development in accordance with the *Environmental Planning and Assessment Act 1979*

MODIFICATION EA PREPARED BY

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PROJECT APPROVAL

07_0018 MOD7

Applicant Name: *Broken Hill Operations Pty Ltd*

Applicant Address: *130 Eyre Street PO Box 5073*
Broken Hill Broken Hill
NSW 2880 NSW 2880

Proposed modification: *Approval is sought to modify the Rasp Mine Project Approval 07_0018 to utilise rock fill material currently stored in BHP Pit for embankments construction at Blackwood Pit TSF2, located on Consolidated Mine Lease 7. This would also include conducting crushing and screening activities within the BHP Pit.*

ENVIRONMENTAL ASSESSMENT

This document provides the environmental impact assessment and mitigation measures for this Modification.

CERTIFICATION

I certify that the contents of this SEE have been prepared and to the best of my knowledge:

- *It is in accordance with the Environmental Planning and Assessment Act 1979;*
- *Contains all available information that is relevant to the environmental assessment of the activities to which this Modification SEE relates; and*
- *The information contained in this Modification SEE is neither false nor misleading.*

Signature:

Name: *Gwendalynn Wilson*
Group Manager – Safety Health Environment Community
CBH Resources Ltd

Date: *June 2019*

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EXECUTIVE SUMMARY

OVERVIEW

Broken Hill Operations Pty Ltd (BHOP) [a wholly owned subsidiary of CBH Resources Limited (CBH)] owns and operates the Rasp Mine (the Mine), which is located centrally within the City of Broken Hill on Consolidated Mine Lease 7 (CML7).

Mining has been undertaken within CML7 since 1885. The existing operations at the Rasp Mine Project include underground mining operations, a processing plant producing zinc and lead concentrate, a rail siding for concentrate dispatch and various supporting infrastructure. These operations are undertaken in accordance with Project Approval (PA07_0018) granted from the then Minister for Planning on 31 January 2011, under Part3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

BHOP is seeking approval for a minor modification (MOD7) to the Project Approval to:

- Utilise waste rock material stored in BHP Pit for Blackwood Pit (TSF2) embankment construction; and
- Conduct crushing and screening activities within BHP Pit.

These activities were approved under MOD4 to be undertaken in Kintore Pit.

This Statement of Environmental Effects (SEE) supports this application and demonstrates that:

- There are no additional significant environmental key issues;
- There would be no additional land disturbance;
- There would be no significant contribution of noise to that provided by modelling in the EIS for Modification 4 (MOD4) and that the construction noise guidelines would still be met, and
- There would be a decrease in potential dust generation from the reduction in transport distance.

MODIFICATION DESCRIPTION AND REASON FOR MODIFICATION

BHP Pit is located centrally within the CML7, **Figure 1-2**. It is surrounded by mining works with Delprats Shaft and mine infrastructure to the north and the processing Plant and Blackwood Pit TSF2 to the north east. Kintore Pit and Rasp Mine infrastructure lay to the west of the Pit. Mount Hebbard (an historic tailing storage facility), rises 20 m above the Pit to its south together with the historic tailings facility TSF1. The Mine Haul Road lies between the Pit and TSF1. A 4 m earth noise bund has been installed along the Haul Road adjacent to TSF1 and extends to the Run of Mine Pad (ROM Pad).

The closest residential location to the north or south is approximately 500 m.

The proposed use of the material stored in BHP Pit would result in a reduction in the transport distance for trucks transporting rock fill to Blackwood Pit TSF2 for embankment construction.

Table 1-1 provides a summary of the existing approved project components compared to the proposed modifications outlined in this SEE.

Table 1-1 Comparison of Existing Approval and Proposed MOD7

Component	Approved Rasp Mine	Proposed MOD7
Mine Life	15 years (includes construction and closure) from 2011 to 2026.	No change (mine life is based on the 'approval to mine' and not on the resource or reserve).
Tenement Status	CML7 – Incorporates the Rasp Mine. Western Lands Leases 2368 and 2369 – within original Project Area and held by BHOP, permitted use is for "*Storage Purposes*".	No change No change
Mining Methods	Underground mining using various methods including long hole, benching, modified Avoca, room	No change.

Component	Approved Rasp Mine	Proposed MOD7
	and pillar or uphole retreat. Within Western and Centenary Mineralisation and Main Lodes Blocks 7 to 12.	
Mining Rate and Total Production	750 000 tpa ore. Total production over life of Project: Approximately 8,450,000 t	No change No change
Waste Rock Disposal	Underground: Backfill. Surface: Material (<0.5% Pb) to be used for road repair and bunding and rehabilitation at closure.	Material <0.5% lead would be used in TSF2 embankment construction
Underground Ventilation	2 x 450 kW primary fans located 160 m below ground and exhausting centrally within CML7, Point 1.	No change
Processing Methods	Crushing, grinding, flotation, thickening and filtration at on-site processing facilities.	No change
Processing Rates	250 tph in crushing plant and 93.8 tph in grinding plant.	No change
Concentrate Production	Lead: 44,000 tpa (concentrate 73% Pb and 985 g/t Ag) Zinc: 87,000 tpa (concentrate 50% Zn)	No change
Tailing Disposal	Course stream returned to mine void (via Backfill Plant) and finer stream to be directed to TSF1 (capacity of 960,000 t) and/or TSF2 (capacity 3.12 Mt)	No change
Facilities	Other associated facilities such as Backfill Plant, Concrete Batching Plant, Rail Loadout, Warehouse, core preparation and storage and workshops.	Temporary mobile crushing and screening plant would be located in BHP Pit.
Services	Extensions to existing substations, water lines and phone lines. New 22kV overhead power lines to be constructed.	No change
Water Supply / Extraction	Potable / treated water 9 ML/a Raw untreated water 139 ML/a Reclaimed / recycled water 300 ML/a Extraction up to 390 ML/a.	No change
External Roads	No changes to external road network.	No change.
Employment Numbers	Employees: 225 Contractors: 35	No change
Hours of Operation	Underground Operations: 7 days per week, 24 hours per day Shunting 7 days per week, 7am to 6pm (not conducted). Construction hours 7am to 6pm Mon-Fri and 8am to 1pm Sat, no construction work on Sundays or Public holidays. Activities not listed above – 7 days per week, 24 hours per day.	No change
Disturbance Footprint	CML7 consists of 342.66 Ha Current land disturbance due to Rasp Mine activities is 28.6 Ha (MOD4).	No change

REGULATORY FRAMEWORK

The Rasp Mine was declared a Major Project under the *State Environment Planning Policy (SEPP) (Major Development) 2005* (now repealed) and was granted approval in January 2011 by the then NSW Minister for the Department of Planning under Part 3A of the EP&A Act. Following repeal of Part 3A and Section 75W of the EP&A Act, the Rasp Mine Project has been transitioned to a 'State Designated Development', SSD-814. This Modification is considered minor as there are no additional significant environmental impacts anticipated from these activities and a reduction to potential dust and noise impacts will result from that presented in the EIS for MOD4.

EXISTING ENVIRONMENT

The Mine is located centrally within the City of Broken Hill and is surrounded by transport infrastructure, areas of commercial and industrial development and some residential housing. Residential and commercial areas surround the Mine with pasture land to the southeast. The land within CML7 has several surface exclusion zones, which contain rail lines and stock yards to the north, along with commercial and some residential properties.

BHP Pit is currently used for the storage of explosives and emulsion used for blasting underground and mineralised waste. BHP Pit is highly disturbed and no vegetation would be disturbed. Heritage items are located approximately 30 m to 40 m from the proposed works, are fenced for protection and would not be impacted.

IMPACTS, MANAGEMENT AND MITIGATION

The proposed MOD7 has the potential to result in a reduction to both dust and noise impacts as outlined in the EIS for MOD4. No additional environmental risks associated with the proposed activities have been identified.

Environmental Assessment Requirements were issued by the Department of Planning and Environment (DPE) for this MOD7, the key areas for consideration were potential impacts from noise and dust and are addressed in this SEE.

Noise

Noise would be generated by the use of a dozer, excavator and crushing and screening activities that would be located in BHP Pit at a depth of 15 m compared to MOD4 where these activities were located in Kintore Pit at 70 m below surface. Mitigation measures would include the existing noise bund installed along the Haul Road and other landscape topography including Mt Hebbard (historic tailing storage facility to the south at 20 m above the Haul Road) and historic waste dumps located along the north of the Haul Road ranging from 5 to 20 m. The use of construction work hours will also restrict the times of these activities.

BHOP engaged EMM Consulting Pty Ltd (EMM) to review its previous noise assessment as presented in MOD4 for this change. EMM concluded that:

"The proposed MOD7 construction activities are unlikely to generate noise emissions from the TSF2 embankments works to increase noise levels above the relevant PA noise limits. Hence, additional noise impacts at surrounding sensitive receivers is unlikely."

Air Quality

Dust would be generated by the use of a dozer, excavator and crushing and screening activities that would be located in BHP Pit at a depth of 15 m compared to MOD4 where these activities were located in Kintore Pit at 70 m below surface. However dust sources will be reduced from the shorter transport distance of haul trucks. Mitigation measures include two water trucks and water sprays installed on the

mobile crusher. Current site dust management measures including ceasing dust generating activities in high winds would also apply.

BHOP engaged ERM Pty Ltd (ERM) to review its previous air quality assessment as presented in MOD4 for this change. ERM concluded that:

"… the total Mine particulate emission inventory is anticipated to be reduced by between 6% and 16% through the use of the BHP Pit as an alternative to Kintore Pit."

Other Potential Impacts

Other potential environmental impacts that were considered included:

- Heritage – the closest heritage items are located 30 m from the proposed activities and will not be impacted.
- Land disturbance – there would be no addition to the current land disturbance footprint and no vegetation is required to be removed for these modifications.

BENEFITS OF MODIFICATION

The proposed minor Modification would result in a range of benefits, including:

- Reduction in travel time for transporting material to embankment locations;
- Reduction in potential dust exposures due to shorter travel distance;
- Reduction in potential noise exposures due to the potential to shorten the construction time;
- Minimise double-handling on feed waste rock and product stockpiles;
- An increase in separation distance from the site boundary compared with the scenario anticipated within the original MOD4 application;
- Reduction in construction time for the embankment works;
- Reduction in diesel fuel usage; and
- Reduction in costs for embankment works.

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1.0 BACKGROUND

This Section provides an introduction to the Rasp Mine Project, the proponent, consultation undertaken and regulator requirements for assessment. It summarises the Modification, its benefits and provides a consideration of alternative options.

1.1 Introduction

Broken Hill Operations Pty Ltd (BHOP) [a wholly owned subsidiary of CBH Resources Limited (CBH)] owns and operates the Rasp Mine (the Mine), which is located centrally within the City of Broken Hill on Consolidated Mine Lease 7 (CML7). The Mine produces zinc and lead concentrates which it dispatches via rail to Port Pirie in South Australia and Newcastle in New South Wales.

The Mine is located centrally within the City of Broken Hill and is surrounded by transport infrastructure, areas of commercial and industrial development and some residential housing. The Mine is bounded by Eyre Street and Holten Drive to the south and east, Perilya's Broken Hill North Mine to the east and South Mine to the west, and the commercial centre of Broken Hill to the north. The Mine site is dissected by two major State roads, including South Road (Silver City Highway SH22) to the southwest and Menindee Road (MR66) to the northeast. The Broken Hill railway station is located directly to the north of the Mine and lies on the main Sydney – Perth railway line. Residential and commercial areas surround the Mine with pasture land to the southeast, **Figure 1-1**.

The land within CML7 has several surface exclusion zones, which contain rail lines and stock yards to the north, along with commercial and some residential properties.

The site has been mined for over 130 years leaving the site highly disturbed with a number of heritage buildings and structures. The majority of the site is covered with historic waste rock or tailings material, there is little topsoil and vegetation.

1.2 Project and Proposed Modification

The Rasp Underground Lead-Zinc-Silver Mine Project (07_0018) (the Project) was declared a Major Project under the State Environment Planning Policy (SEPP) *Major Development 2005* (now repealed) requiring the approval of the then NSW Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979 (*EP&A Act). Approval was granted on 31 January 2011 for underground mining, the construction and operation of a processing plant to produce lead and zinc concentrates and a rail siding for concentrate dispatch. The Project Approval (PA) has subsequently been modified on five occasions:

- MOD1: to accommodate the relocation of the main ventilation shaft;
- MOD2: to allow crushing of ore to occur at any time;
- MOD3: to extend underground mining into Block 7; and
- MOD4: to install a Concrete Batching Plant and three embankments and a retaining wall at Blackwood Pit Tailings Storage Facility (TSF2).
- MOD5: to Stores Warehouse Extension, Installation of a Cement Silo and Removal of Shaft 6 Monitoring.
- MOD6: to use Kintore Pit for tailing storage, install a new portal for underground mine access and store excess waste rock in surface stockpiles – not yet approved.

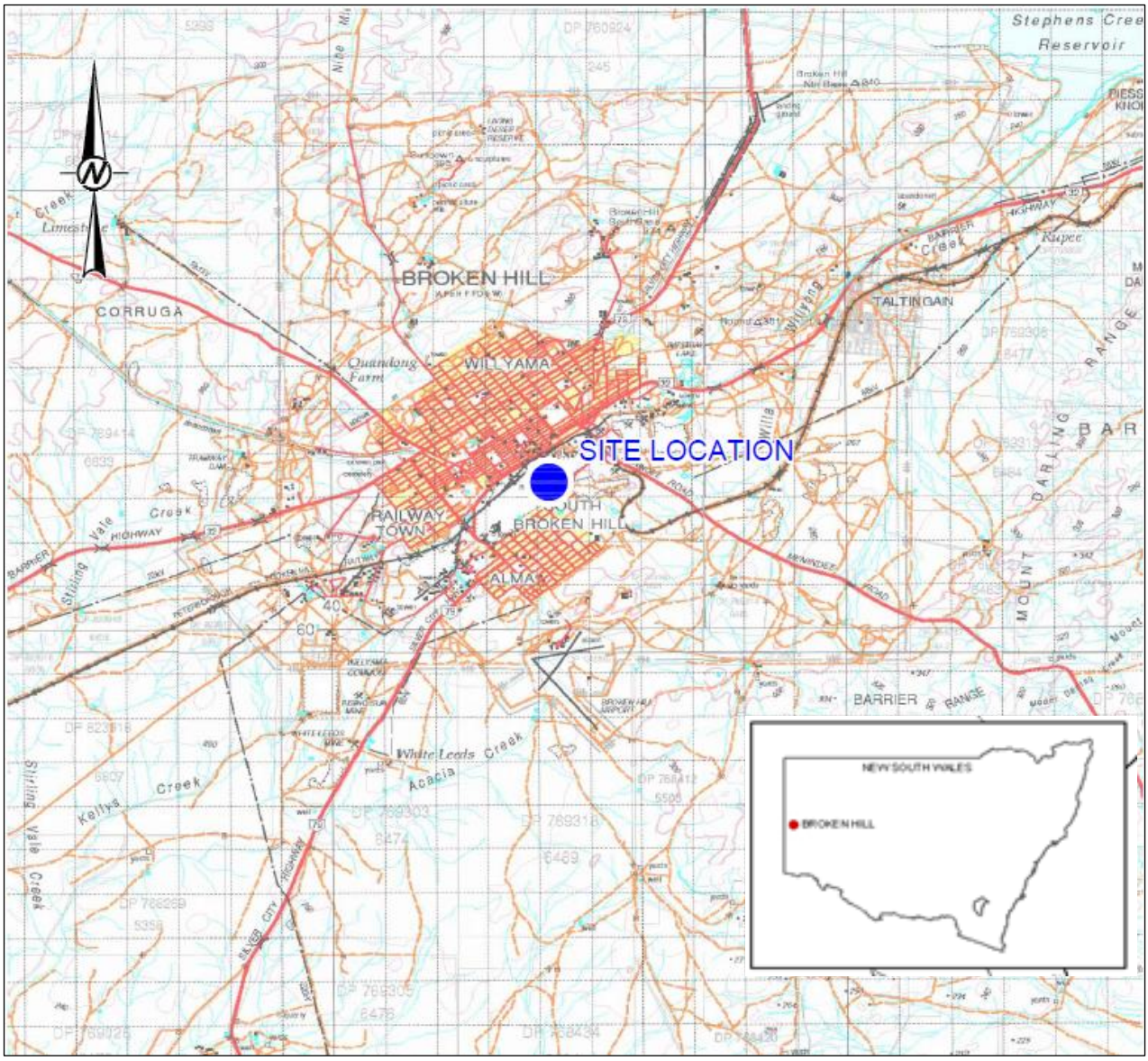
BHOP seeks a minor Modification (MOD7) to its Project Approval to utilise waste rock material for embankment construction currently stored in BHP Pit and to conduct crushing and screening activities within BHP Pit. These activities were approved, 4 September 2017, under MOD4 and were to be undertaken in Kintore Pit.

The level of environmental assessment completed for MOD7 is considered appropriate given that the Modification would improve the environmental outcomes for dust and noise exposures from those

proposed in the MOD4 EIS. The activities are consistent with mining operations as outlined in the original Environment Assessment (EA).

Following repeal of Part 3A and Section 75W (transition provision) of the EP&A Act, the Rasp Mine Project has been transitioned to a State Significant Development (SSD) (SSD-814) and MOD7 would be considered under the assessment pathway for SSD. This Statement of Environmental Effects (SEE) supports the application.

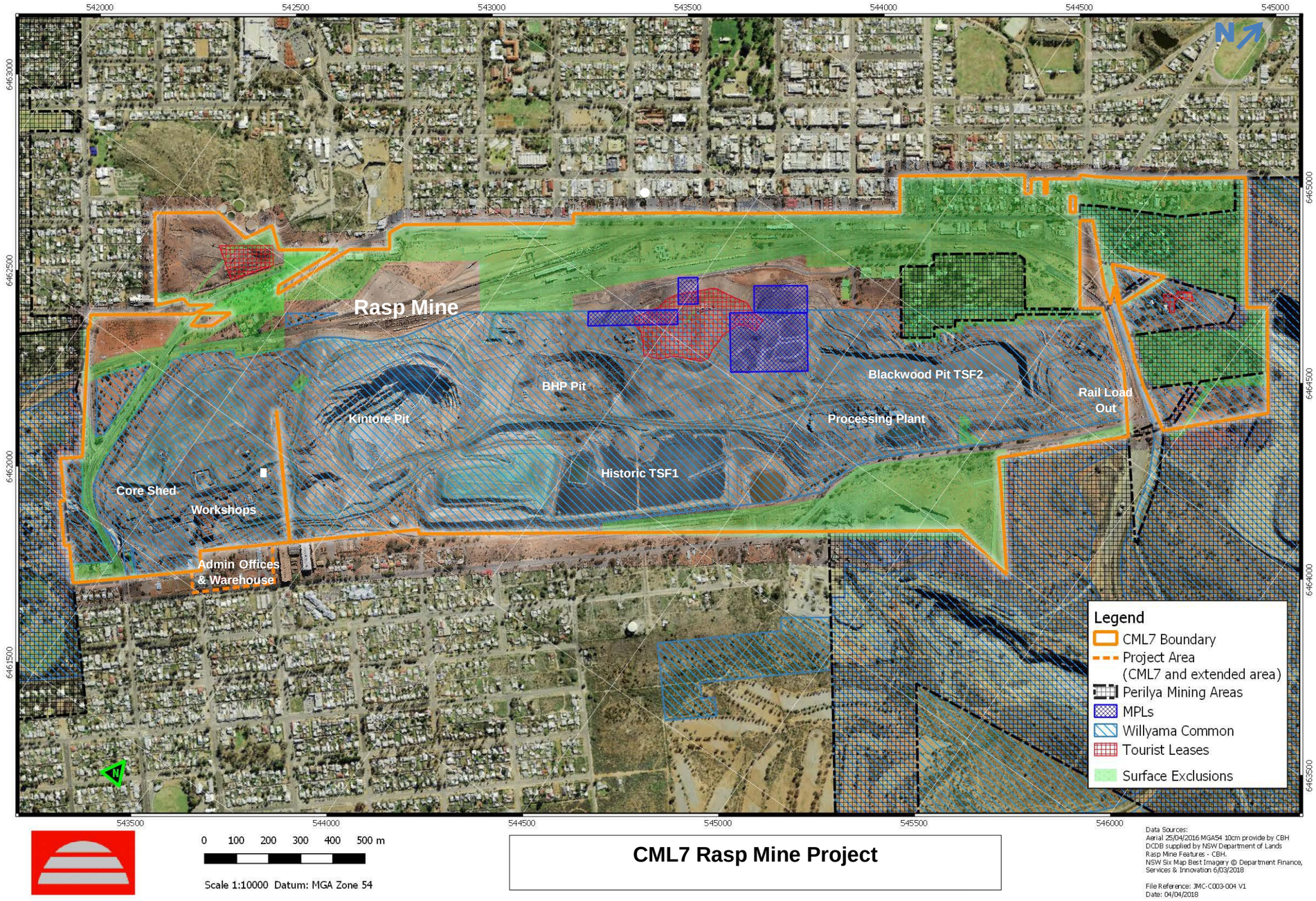
Figure 1-1 Locality Map



All activities for the proposed MOD7 would be located on land previously disturbed by historic mining operations, there would be no addition to the current land disturbance footprint and no vegetation is required to be removed, **Figure 1-2**. The proposed activities would not be visible from any point in the City of Broken Hill.

The proposed MOD7 activities lay within the Project Area as outlined in the original EA and would be undertaken within Consolidate Mine Lease 7 (CML7).

Figure 1-2 CML7 Indicating Location of Kintore Pit and BHP Pit



1.3 Reason for the Proposed Modification

Recent geotechnical testing of the waste rock material stored in BHP Pit has confirmed its suitability for TSF2 embankment construction. The reason for considering the use of this material is:

- Reduction in travel time for transporting material to embankment locations;
- Reduction in construction time for the embankment works; and
- Reduction in costs for embankment works;

1.4 Benefits to the Project

BHP Pit is located closer to the embankment works and relocating these activities to BHP Pit would reduce travel distances by up to a third, resulting in a reduction of dust generation from traffic movements on both sealed and unsealed road sections.

In addition the use of BHP Pit will minimise double-handling on feed waste rock and product stockpiles (dedicated stockpiles) thus minimising handling and the potential for dust generation.

The use of BHP Pit as opposed to Kintore Pit for crushing and screening means that these potentially dust generating activities would be contained more centrally within the site boundary (i.e. at an additional separation distance from the site boundary compared with the scenario anticipated within the original MOD4 application).

Finally the reduction in transport distance will reduce the transporting time and thus construction of the embankments. This in turn reduces:- fuel used, costs, and impacts from these construction works to the local community.

1.5 Alternatives to the Proposed Modification

The alternatives to using the material currently stored in BHP Pit and undertaking crushing and screening activities in BHP Pit are:

(1) To continue to use material solely from Kintore Pit: This alternative is not preferred as this would negate the advantages of using the material in BHP Pit, or
(2) To use material directly transported from underground: Mining transport excess waste rock from underground to the surface at intermittent intervals when they are unable to locate storage in an underground void. This alternative is not preferred as without surface stockpiling there is insufficient material to fulfil the needs of the embankment construction in a timely manner.
(3) To use Little Kintore Pit for crushing and screening activities: Little Kintore Pit is the only other pit on site. This Pit is located adjacent and south of Kintore Pit and is further from the embankments that BHP Pit and is 17 m deep. This location is not preferred due to its greater distance and the need to construct road access into the Pit.

1.6 Consultation and Agency Requirements for Environment Assessment

Discussions regarding the proposed MOD7 were undertaken during the review meeting for the Rasp Mine Annual Environment Management Review held at the Rasp Mine, 17 June 2019. In attendance were representatives of the Department of Planning and Environment – Resources Regulator (RR), Department of Planning and Environment – Compliance Branch (DPE), the Environment Protection Agency (EPA) and Broken Hill City Council (BHCC). An inspection of the site was undertaken and a copy of the Briefing Paper summarising MOD7 was provided. Discussions were mainly centred on the potential for noise and dust impacts. No additional key environmental issues were raised and support was indicated for the Project given the anticipated reduction in dust generation.

Department of Planning and Environment - Resource & Energy Assessments provided a list of key areas to be addressed in this SEE (by Letter 25 June 2019, **Appendix A**). These are listed in **Table 1-2**.

Table 1-1 DPE Matters to be Addressed for MOD7

Document	Key Area	Response in SEE
Letter: 25 June 2019 Appendix A	Evidence of engagement with the NSW Environment Protection Authority, Resources Regulator and Broken Hill City Council.	Section 1.6
	The rock fill material in the BHP Pit is suitable for embankment construction, in relation to lead content and appropriately monitored and managed during construction.	Section 4.1 and Appendix B
	Demonstration that there is minimal incremental impacts compared to the approved project, particularly in relation to noise and air from the relocation of the crusher, and that the operating conditions and relevant noise and air criteria would continue to be met.	Sections 5.2.1 – Noise 5.2.2 - Air Appendices C & D

This Statement of Environmental Effects (SEE) has been prepared to support the Project Approval Modification Application, which will be lodged with the DPE for determination by the Minister for Planning (or delegate). A description of the activities proposed in this Modification Application (MOD7) is provided in **Section 4** of this SEE. The Modification sought is otherwise consistent with the BHOP original EA, Preferred Project Report (PPR) and PA 07_0018 (as Modified). The schedule of land to which this SEE applies is also consistent with the BHOP EA, PPR and PA 07_0018.

The Executive Summary provides an overview of the proposed modification and the potential impacts and mitigation measures. The following sections of the SEE include:

Section 1 - Introduction and details of the proponent, consultation and regulator requirements for assessment, summarises the Modification, its benefits and alternatives;

Section 2 - Details the existing approved operations at BHOP;

Section 3 - Discusses the regulatory framework relevant to the Modification;

Section 4 - Provides a description of the Modification its location and operation;

Section 5 - Summarises the potential environmental issues for the proposed Modification and their mitigation measures;

Section 6 - Lists management commitments to be implemented as a result of the Modification;

Section 7 - Outlines the conclusion and provides a justification for the Modification as sought;

Section 8 - Provides a list of abbreviations referenced in this SEE.

2.0 EXISTING OPERATIONS

This section provides detail on the existing approved operations at BHOP including land tenure and ownership, consents and licences and operations.

2.1 Project Approval

2.1.1 Environment Assessment and Preferred Project Report

2.1.1.1 Environmental Assessment

An *Environmental Assessment* (EA) (BHOP, July 2010) supported the Project application for the original Rasp Underground Lead-Zinc-Silver Mine Project (07_0018) and described the following elements of the Project:

- Mining of 8,450,000 t of ore until 31 December 2026;
- Construction and/or extension of associated infrastructure, plant and equipment, including upgrade of internal roads and construction of an on-site noise abatement barrier;
- Transport of ore to the surface in haul trucks;
- Ore processing using crushing, milling and flotation;
- Waste rock to be used underground for backfilling of voids, stored in Kintore or BHP Pits or when tested and below <0.5% lead, used for road repair, bunding and rehabilitation.
- Tailings management, to be deposited into Blackwood Pit (TSF2), and used as back fill for underground mining voids (yet to commence);
- Works for surface water management; and
- Construction of a rail siding and transport of concentrate in covered rail wagons to a smelter and/or port.

2.1.1.2 Preferred Project Report

BHOP subsequently amended the layout and design of the Project in order to further minimise environmental impacts and streamline operations. A Preferred Project Report (PPR) was submitted in September 2010 outlining the proposed changes to the Project and the subsequent reductions in environmental impacts. Updated environment assessments for air quality, noise and vibration, and storm water management were also submitted as part of the PPR.

These amendments involved:

- Modifying the Project Area to include the new rail load-out area at the north-eastern end of the site;
- Re-locating the processing plant to the north-eastern end of the lease (away from densely populated residential areas);
- Removing secondary and tertiary crushers and screens from the crushing circuit; and
- Loading concentrate into containers on trucks and transporting them to a newly constructed rail siding located towards the north-eastern end of the Lease.

2.1.2 Approved Project and Current Mining Activities

On 31 January 2011 the Project Approval (07_0018) for the Rasp Underground Lead-Zinc-Silver Mine Project was granted under Part 3A of the EP&A Act. The key features of the Rasp Mine are provided in **Table 2-1**.

Table 2-1 Key Features of the Rasp Mine

Item	Description
Mine life	15 years to 31 December 2026
Tenement status	CML7 – Incorporates the Rasp Mine.
Mining methodology	Underground mining using various methods including long-hole open stoping (benching, uphole retreat and modified Avoca), room and pillar or cut and fill.
Mining Area	Western Mineralisation, Centenary Mineralisation, Main Lode Pillars (Blocks 8 to 12)
Mining rate and total production	750,000 tpa ore.
Total production over life of Project:	Approximately 8,450,000 t
Waste rock disposal	Underground: Backfill Surface: Material tested to contain <0.5% lead to be used for road repair, bunding, TSF2 embankment construction and rehabilitation
Processing methodology	Crushing, grinding, flotation, thickening and filtration at on-site processing facilities.
Processing rates	250 tph in crushing plant and 93.8 tph in grinding plant.
Concentrate production	Lead: 44,000 tpa (concentrate 73% Pb and 985 g/t Ag) Zinc: 87,000 tpa (concentrate 50% Zn)
Tailings disposal	Tailings disposal to TSF2 Blackwood Pit and to be used as backfill in underground stopes.
Other mine infrastructure	Primary ventilation shaft, mechanical and electrical workshops, core shed and exploration facilities, warehousing, rail load out, backfill plant, concrete batching plant
Services	Extensions to existing substations, water lines and phone lines. 22kV overhead power lines.

All mining extraction is conducted underground. Current mining activities extend between and include Blocks 7-12 in the old Main Lode orebody (comprising 2 and 3 lens material and includes the Zinc Lodes) and the Western Mineralisation orebody. The Main Lode has been mined since the late 1800's and BHOP now conducts remnant mining in these areas to extract pillars and narrow remnants that have been left over the course of 100 years of mining. Current production rates are approximately 720,000 t per annum.

2.1.3 Project Approval Modifications

Since approval of the Project, five separate Modifications to the original Project Approval have been approved. The nature of these modifications is described in **Table 2-2**.

Table 2-2 Rasp Mine Project Summary of Approval Modifications

Modification	Purpose	Date Approved
MOD1	Relocation of the ventilation shaft and installation of the ventilation fans underground.	16 March 2012
MOD2	Allow crusher to be operated at any time (24 hours per day 7 days per week).	29 August 2014
MOD3	Extension of underground mining to include Block 7 (also included the Zinc Lodes).	17 March 2015
MOD4	Installation of a Concrete Batching Plant. Construction of three embankments and a retaining wall at Blackwood Pit TSF2.	4 September 2017
MOD5	Installation of a cement silo at the Backfill Plant, extension to current warehouse and adjustment to air quality monitoring.	2 November 2018
MOD6	Kintore Pit TSF3, new portal and surface waste rock stockpiles.	Not yet submitted for determination to DPE determination

2.2 Current Consents, Authorisations and Licences

2.2.1 Current Consents

Table 2-3 lists the consents held by BHOP for the Rasp Mine Project.

Table 2-3 Development Consents

Approval	Date Issued	Duration	Purpose
DA 125/2001	5 Sept 2002	Work completed	Surface drilling on CML7 in surface exclusion zone (near rail), supported by a Statement of Environmental Effects (SEE).
MOP 06/6463	26 Oct 2006	31 Aug 2008	Construct exploration decline, conduct drilling and obtain bulk sample.
DA 101/2007	26 April 2007	Work completed	Undertake temporary mining in the Kintore Pit, supported by a SEE.
MOP 06/6436 Amendment	5 May 2008	31 Oct 2008	Extend the exploration decline.
MOP 06/6463	1 Sept 2009	31 Dec 2010 Extended to 31 March 2011 Works not undertaken	For underground mining and stockpiling 120,000 of ore to be transported to Endeavor for processing, supported by a REF.
DA 264/2009	19 Jan 2010	2 Feb 2011	For ancillary surface mining activities including crushing, stockpiling and transport of ore, supported by a SEE.
PA 07_0018 (Part 3A)	31 Jan 2011	31 Dec 2026	Mining production of 750,000 tpa from Western Mineralisation, Centenary Mineralisation and Main Lode Pillars. Construction and operation of a minerals processing plant and rail loadout facility. Supported by an Environmental Assessment (EA).
MOP 06/6483	1 April 2011	31 Mar 2014 Extended to 31 Oct 2014	Mining production of 750,000 tpa from Western Mineralisation, Centenary Mineralisation and Main Lode Pillars. Construction and operation of a minerals processing plant and rail loadout facility.
PA 07_0018 MOD 1	16 March 2012	31 Dec 2026	Relocation of ventilation shaft.
MOP 06/6463	30 March 2012	31Mar 2014 Extended to Jun 2014 , Aug 2014, Oct 2014	Relocation of ventilation shaft.
PA 07_0018 MOD 2	29 August 2014	31 Dec 2026	Allow 24 hour crusher operation.
MOP 06/6463	Nov 2014	Oct 2015	New MOP for underground mining, ore processing and dispatch of concentrates, including ancillary activities.
PA 07_0018 MOD3	17 March 2015	31 Dec 2026	Extension of underground mining to include all of Block 7 and the Zinc Lodes.
MOP 06/6463 Amendment	March 2015	Oct 2015	Extension to allow MOD4 to be incorporated into new MOP.
PA 07_0018 MOD4	4 Sept 2017	31 Dec 2026	To allow the installation of a Concrete Batching Plant and construction of embankments and a retaining wall for Blackwood Pit TSF2.
MOP 06/6463	Nov 2015	30 Sept 2017	New MOP for underground mining, ore processing and dispatch of concentrates, including ancillary activities, Concrete Batching Plant and Blackwood Pit TSF2 embankments and retaining wall.
Dam Safety Committee	9 Dec 2017	-	Endorsement for Blackwood Pit TSF2 extension design for embankments and retaining wall, conform to DSC requirements.
MOP 06/6463	1 Oct 2017	30 Sept 2019	New MOP for underground mining, ore processing and dispatch of concentrates, including ancillary activities.
PA 07_0018 MOD5	2 Nov 2018	31 Dec 2026	Installation of cement silo at the Backfill Plant, extension to current warehouse and adjustment to air quality monitoring

2.2.2 Leases

Table 2-4 presents the mineral authorities held by BHOP for the Mine. For the purposes of this document, the area covered by CML7 and MPLs 183, 184, 185 and 186 within the surface area rights of BHOP, is

referred to as the Rasp Mine which also includes various Western Land Leases and properties owned by BHOP.

Table 2-4 Mineral Authorities and Leases

Mineral Authority / Lease	Grant Date	Last Renewed	Renewal Date	Purpose
CML7	8 Oct 1987	17 Apr 2007	31 Dec 2026	As per Schedule 2 of the Lease - Open cutting, shaft sinking, stoping, tunnelling, building of dams, extraction and obtaining minerals, generation of electricity, erecting dwellings, storage of fuels, dumping of ore, treatment and dumping of tailing, development of roads
MPL 183	4 Feb 1981	24 Apr 2007	31 Dec 2026	Dumping of ore and mine residues, treatment of tailing
MPL 184	4 Feb 1981	24 Apr 2007	31 Dec 2026	Dumping of ore and mine residues, treatment of tailing
MPL 185	4 Feb 1981	24 Apr 2007	31 Dec 2026	Dumping of ore and mine residues, treatment of tailing
MPL 186	4 Feb 1981	24 Apr 2007	31 Dec 2026	Dumping of ore and mine residues, treatment of tailing
WLL 2547	15 Jan 1913	14 Jun 1973	In perpetuity	Storage and erection of machinery.
WLL 2638	13 May 1914	14 Jun 1973	In perpetuity	Storage purposes.
WLL 2639	13 May 1914	14 Jun 1973	In perpetuity	Storage purposes.
WLL 2649	8 Jul 1914	14 Jun 1973	In perpetuity	Storage and erection of machinery.
WLL 2650	8 Jul 1914	14 Jun 1973	In perpetuity	Storage and erection of machinery.
WLL 3183	1 Jan 1925	14 Jun 1973	In perpetuity	Storage and erection of machinery.

This Modification applies to CML7 and will have no impact on any of the other MPLs or WLLs listed.

2.2.3 Licences/Permits

Table 2-5 presents the licences held by BHOP in relation to the Mine.

Table 2-5 Licences / Permits Held

Licence / Permit	Issued By	Date of Expiry/ Renewal	Purpose
EPL 12559	EPA	Upon surrender, suspension or revocation.	Authorises the carrying out of scheduled activities: Crushing , grinding or separating >500,000 – 2,000,000T processed. Mining for minerals >500,000 – 2,000,000T produced.
Dangerous Goods Explosives	Work Cover	24 Oct 2022	Store and Manufacture
Refrigerant	Refrigerant Trading Council	22 March 2022	Use of refrigerant
Water extraction 85WA752823	DPI-Water	29 Mar 2027	To extract 370 ML for use on site or to send to Perilya Broken Hill Operations Pty Ltd.
Radiation	EPA	26 Jul 2019	Sell and/or possess radiation apparatus. Sell and/or possess radioactive or items containing radioactive substances.

2.3 Land Ownership

The majority of the land on which the CML7 and MPLs are located is designated as "WILLYAMA COMMON Reserve 2421" (refer to **Figure 2-1**). The Lease was originally gazetted on 4th September 1886. Only a small portion of the Lease area is freehold and this land is identified in Certificate of Title 4635/757298. The land within CML7 upon which BHOP has surface rights is leased from the Crown through a series of Mining and Western Land Leases, with the exception of one freehold block (Block 10) located towards the centre of CML7. All activities associated with this Modification would be located on CML7 and within Willyama Common.

Figure 2-1 Consolidated Mine Lease 7

3.0 REGULATORY FRAMEWORK

This section discusses the regulatory framework relevant under which the Rasp Mine is approved to operate relevant to the Modification.

3.1 Commonwealth Legislation - Environmental Protection

3.1.1 Environmental Protection and Biodiversity and Biodiversity *Conservation Act 1999* (EPBC Act)

3.1.1.1 Controlled Actions

The proposed Modification is not considered a 'controlled action' as it is consistent with the original Project Approval, it will not impact matters of National Environmental Significance (NES) as listed in the EPBC Act and would not impact water resources. Therefore the proposed Modification does not require referral to the Commonwealth.

3.1.1.2 Heritage

Pursuant to Section 324JJ of the EPBC Act, the entire city area of Broken Hill was listed on the National Heritage List (ID 105861) in January 2015, primarily for the geological significance of the ore body, its mining history and technical achievements, the area is protected under the Act.

BHOP does not consider a referral to the Commonwealth for environmental assessment is required for this Modification as it would be unlikely to have a significant impact on any of the matters of environmental significance; no heritage items will be impacted and the activities associated with the Modification are consistent with mining processes.

3.2 NSW Legislation –

3.2.1 Environment Planning and Assessment Act 1979

The Project was declared a Major Project under the SEPP *Major Development 2005* (now repealed) and was approved in January 2011 by the then NSW Minister for the Department of Planning under Part 3A of the EP&A Act. With the repeal of Part 3A of the Act and the transitional arrangements under Section 75W, the Project has been transitioned to a State significant Development.

This Modification application is made under Section 4.55 of the EP&A Act which provides for the modification of consents and Sub-Section (1A) which provides for modifications involving minimal environmental impact. This was confirmed by the DPE letter dated 25 June 2019, **Appendix A**.

The level of environmental assessment completed for this Modification is considered appropriate given that there have been no significant environment impacts identified, that the activities are consistent with mining operations as proposed in the original consent, and that:

- There is no change to the current approved mining and/or production rates;
- There is no change to the disturbance footprint;
- Current environmental controls would mitigate any potential impacts:- use of construction hours and noise abatement bunding along the Haul Road would assist in noise mitigation, current dust management practices including water sprays and water truck would assist in dust mitigation; and
- The Modification would result in reductions to both noise and dust impacts to those predicted in MOD4.

3.2.2 Other NSW Legislation

The existing approvals, licences and authorities relevant to the Project are described in **Section 2**. Existing approvals, licences and/or authorities under various other pieces of NSW State legislation would continue to apply to the proposed Modification operations. **Table 3-1** lists the key relevant pieces of NSW State legislation and indicates the implications, if any, for the Modification and Project as a whole.

Table 3-1 Relevant NSW State Legislation

NSW State Legislative Act	Project Implications to Approvals, Licences and/or Authorities
Protection of the Environment Operations Act 1997 (POEO Act)	The proposed Modification would continue to operate under the approved limits and scheduled activities within the current EPL 12559. No variation required.
Mining Act 1992	CML7 permits the extraction of zinc and lead (among others) ore within the Project Area, the Modification does not result in any changes to mining production totals or processing. Therefore there is no need for any amendments to authorities under this Act. Environmental protection and rehabilitation are also regulated under this Act by conditions of mining leases, including requirements for the submission of a Mining Operations Plan (MOP). The current MOP will require a minor amendment to include the activities outlined in the Modification.
Water Management Act 2000	No additional water licences under the *Water Management Act 2000* are required for the Modification. Water resources will not be affected by this Modification.
Work Health & Safety (Mines & Petroleum) Act 2013	BHOP will utilise for this Modification its current standards, plans and procedures in accordance with the *Work Health & Safety Act 2011*.
Heritage Act, 1977	The heritage items within BHP Pit will not be affected by this Modification.
Threatened Species and Conservation Act 1995	Not relevant to this Modification.
National Park and Wildlife Act 1974	Not relevant to this Modification.
Aboriginal Lands Rights Act 1983	Not relevant to this Modification.

3.3 SEPP - Mining, Petroleum Production and Extractive Industries

The State Environment Protection Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP), aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of NSW. Part 3 of the Mining SEPP stipulates matters for consideration by the consent authority before determining an application for consent in respect of development for the purposes of mining. Specifically, Clauses 12 to 17 (inclusive) requires consideration to be given to the significance of the resource, the compatibility of projects with other surrounding land uses, including the existing and potential extraction of minerals, natural resource management and environmental management, resource recovery, transportation and rehabilitation.

The information presented in this SEE addresses each of the matters for consideration prescribed in the abovementioned clauses, as applicable.

Under Clauses 12 and 14 the consent authority is required to consider the compatibility of the Project with other nearby land uses and impacts on significant water resources, threatened species and greenhouse emissions.

Existing and approved land uses in the vicinity of the Modification consist of:

- Delprats Shaft historic workings; and
- Current mining infrastructure and operations of BHOP;

The Modification would not change these existing uses and would operate without impacting these users beyond the impacts currently approved. The Café and Miners Memorial are also located on CML7 beyond Delprats Shaft and would not be impacted by the Modification.

There is no additional water usage requirements to those outlined in MOD4.

There is no increase to land disturbance and there is no vegetation or fauna habitats in the vicinity of the Modification activities which will be conducted on mine disturbed land.

There would be a minor reduction to greenhouse gas emissions due to the shorter trucking distance, than that presented in MOD4.

3.4 Local Council Environment Planning Instruments

3.4.1 Broken Hill Local Environment Plan 2013

The majority of the Mine, including the area proposed for MOD7 activities in BHP Pit, is within Special Purpose Zone 1 (SP1) Special Activities – Mining [BHCC Local Environment Plan (LEP), 2013].

3.4.2 Broken Hill Control Plan No 11 Management of Lead Contamination

Development Control Plan (DCP) 11 provides guidelines for the management of issues relating to lead contamination. There are no changes to lead contamination anticipated with this Modification.

4.0 DESCRIPTION OF PROPOSED MODIFICATION

The following section describes the location of the proposed modification and details the proposed activities.

4.1 BHP Pit & Proposed Activities

BHOP are about to commence construction of the Stage 1 of the embankment project which includes an on-site access road, a starter embankment for Embankment 1, construction of Embankment 2 and installation of the Spillway as approved in MOD4.

In MOD4 it was stated that the embankments were to be constructed with rock fill – waste rock material excess from underground development works stored in Kintore Pit and that crushing and screening activities would be conducted on the floor of the Kintore Pit, 70 m below surface. More recently waste rock has been stored in BHP Pit, in line with the original Environment Assessment (Chapter 18 Draft Statement of Commitments, of the Original EA for the Rasp Mine Project under Waste Management and again in the Revised Statement of Commitments for the Preferred Project Report at Annexure A), which is located closer to TSF2. BHOP now propose to utilise this material for embankment construction.

BHP Pit is located centrally within the Mine, **Figure 1-2** (**Figure 4-1** shows an aerial of the Pit). It is surrounded by mining works with Delprats Shaft and mine infrastructure to the north and the processing Plant and Blackwood Pit TSF2 to the north east. Kintore Pit and Rasp Mine infrastructure lay to the west of the Pit. Mount Hebbard (an historic tailing storage facility), rises 20 m above the Pit to its south together with the historic tailings facility TSF1. The Mine Haul Road lies between the Pit and TSF1. A 4 m earth noise bund has been installed along the Haul Road adjacent to TSF1 and extends to the Run of Mine Pad (ROM Pad). The explosives store is located approximately 125 m to the west.

The closest residential location to the north or south is approximately 500 m.

The overall dimensions of the Pit are 347 m at its longest point and 198 m at its widest point, the proposed working area of the Pit floor is 15 m below surface and is approximately 60 m by 50 m. A deeper section lies to the north east of the Pit and is 100 m x 90 m and 29 m deep.

Kintore Pit is located 2.5 km from Embankment 2 (EMB2) and BHP Pit (the Pit) is located 1.6 km from Embankment 2, which will result in a reduction of truck travel distance of approximately 45%, **Figure 4-2**. Depicted in **Figure 4-2** is the travel distance from Kintore Pit to EMB2 represented by the yellow and blue lines and the travel distance from BHP Pit to EMB2 represented by only the blue line.

Total material required for construction of all three embankments is approximately 68,500 m^3 or 140,000 t. Approximately 71,000 t will be required to complete Stage 1 works with most of this material being placed at EMB2.

Figure 4-1 BHP Pit

There is no vegetation in this area and there would be no impact to flora or fauna. The closest heritage items, as listed in the BHCC Local Environment Plan 2013, are located approximately 30 m to 40 m from the proposed activities, are fenced for their protection, and would not be affected. These items have not been impacted by the conduct of other activities within the Pit including the placement and storage of waste rock in the Pit.

There is no requirement for site preparation as the surface is flat and stable.

The proposed activities for Stage 1 are scheduled to occur over a 18 week period, from late June to mid-October. Waste rock will initially be moisture conditioned in-situ with a water cannon attached to the water truck, reclaimed using a dozer and then stockpiled. Moisture of the feed stockpiles will be maintained by use of a water truck equipped with sprays and a high pressure water cannon. After the material is sufficiently moist, depending on the particle size, it would either be loaded out with an excavator into a mine haul truck for transport to the embankments, or further processed through a crusher to reduce the particle size down to the required fraction, sub-200 mm for rock fill and sub-50 mm for road base. The sizing of the sourced material is unknown and until the material is reclaimed it is not known if crushing and/or screening will be required. This will depend on how much over-sized material is in the stockpile. It is anticipated the majority of the material will be within particle size specification for the rock fill.

The material will be tested for its lead content and material in excess of 0.5% lead will not be used (crushed or screened). The BHOP Procedure – Waste Rock Testing (BHO-PRO-ENV-036) is currently being updated for this purpose. Three stockpiles will be created: Stockpile 1 for untested material, Stockpile 2 for material

that has been tested at <0.5% lead and is suitable for embankment construction, and Stockpile 3 for material tested and is >0.5% lead, this material will be returned to the deeper section of the Pit and capped.

Material suitable for embankment construction would be water conditioned then loaded into a mine truck (50 t) using an excavator and transported to the required embankment, unloaded rolled and compacted.

The waste rock material is the same as that used for the noise bund surrounding the Concrete Batching Plant where XRF testing (nearly 2000 readings) indicated that 93% of the material had a lead content below 0.5% (in 64 % of the readings no lead was identified). Therefore it is anticipated that up to 5,000 t may be above the 0.5% lead and will be stored in the deeper section of the Pit.

The waste rock fill material to be recovered in the Pit is on the same surface level as the sorting, crushing and screening activities, unlike in Kintore Pit, subsequently there is no requirement for double handling. In Kintore Pit the top of the waste rock tipple is located approximately 530 m distance to the crushing and screening area. The waste rock fill would be sorted at the top of the tipple and suitable material taken to the crushing and screening area where it would be unloaded and processed. This material would then be reloaded and taken to the embankments. The use of the material in BHP Pit avoids this additional transport and double handling of material.

The recovery of the waste rock material and the sorting crushing and screening activities will only occur as part of construction activities and will be limited to Monday to Fridays – 7am to 6pm, Saturdays – 8am to 1pm and no work on Sunday or public holidays.

Figure 4-2 Proposed Transport Route

5.0 ENVIRONMENTAL REVIEW AND ASSESSMENT

This Section describes the environmental risk review and summarises the mitigation measures to reduce any potential environmental impacts.

5.1 Environment Risks and Review

A review of potential environmental risks was undertaken in line with proposed activities as outlined in MOD4, **Table 5-1**. There are no new significant environmental risks identified resulting from this Modification.

Table 5-1 Review of Potential Environmental Impacts

Issue	Relevance	Key Issue
Noise	Noise would be generated by: - the use of an excavator and crusher/screen within a pit that is 15 m deep as compared to MOD4 at 70 m deep, the distance to receptors has generally decreased. - the distance for trucks transporting rock fill to the embankments has decreased by up to a third thereby reducing duration of noise exposures.	No No
Air Quality	*Dust emissions* Dust would be generated during by: - the operation of an excavator and crusher/screen within a pit that is 15 m deep as compared to MOD4 at 70 m deep, the distance to receptors has generally decreased. - the distance for trucks transporting rock fill to the embankments has decreased by up to a third thereby reducing duration of noise exposures. *Diesel emissions* Diesel emissions generated from trucking would be reduced with the shorter distance travelled.	No No No
Community Health	With the reduction in dust emissions a reduction in impacts to community health compared to the assessment in MOD4 is anticipated.	No
Heritage	Heritage items are located 30 to 40 m from the proposed activities within the Pit and would not be disturbed.	No
Water	Water will be used for dust suppression, it is not expected that the volumes required would significantly impact current water usage capacities. There are no changes to stormwater management.	No No
Traffic and Transport	Internal travel distances for the transport of rock fill to the embankments would be reduced. There are no changes to external traffic.	No No
Ecology	No vegetation would be removed and no habitats would be impacted.	No
Visual Amenity	The relocation of the activities will not be seen from the City of Broken Hill.	No
Land Disturbance	No additional land disturbance would be required.	No
Rehabilitation	The proposed modification would be located in an area that is already highly disturbed and has been included in the original EA. Rehabilitation would be consistent with the existing EA.	No

5.2 Discussion of Potential Impacts and Proposed Mitigation Measures

There were no significant key issues identified for MOD7. The following reviews the potential environmental impacts identified and their proposed control measures.

5.2.1 Noise

Potential Noise Impacts

Noise would be generated during crushing and screening activities and by the use of a dozer, an excavator and mine haul trucks. The dozer and excavator would operate in BHP Pit at 15 m below surface compared to Kintore Pit at 70 m below surface. The dozer would be used to reclaim the material and the excavator would be used to manage stockpiles and load material into the crusher and mine haul trucks. The haul truck would then transport this material to the required embankment for placement and compaction. The transport distance from BHP Pit to EMB2 (the furthest point for construction) is approximately 1.6 km which is 0.9 km shorter than the transport distance from Kintore Pit. This would enable additional truck movements each day which would decrease the construction time. These haul trucks would operate behind a 4 m high noise bund to the south and 5 to 20 m high waste dumps to the north.

BHOP engaged EMM Consulting Pty Ltd (EMM) to conduct a review of their noise assessment for MOD4 to identify any potential for significant environmental impacts, **Appendix B**. The review identified a marginal increase in noise levels (up to 2 dB) as compared to total site noise predictions in MOD4 noise assessment report (EMM 2017). The worst-case predicted LAeq,15min in MOD4 was 54 dB at A12 during the construction of EMB2. EMM concluded that total site noise levels from the TSF2 embankments works, including the proposed MOD7 activities, were expected to remain well below and hence satisfy the PA noise limits of 65 dB LAeq,day. Therefore, no additional noise impact is expected from the proposed changes sought for MOD6/MOD7.

Mitigation Measures

South Broken Hill residents are protected from noise exposures by a 4 m noise bund installed along the Haul Road and Mt Hebbard which rises approximately 20 m from the surface of the Haul Road. The distance of the proposed activities to these residents has also increased from approximately 550 m to 610 m. Excavator and trucks have squawker type reversing alarms. As routine practice there is also regular reinforcement at pre-starts and toolbox talks of the need to minimise noise.

North Broken Hill residents are protected from noise exposures from haul road trucks by historic mine waste dumps ranging from 10 m to 15 m in height. The distance from noise source to receptors decreases from 705 m at Kintore Pit to 615 at BHP Pit, however the Broken Hill rail shunting yards are located between BHP Pit and these receptors and it is not expected that noise from MOD7 activities would be discernible above current noise levels.

As MOD6/MOD7 activities form part of construction they are scheduled for day time only - 7am to 6pm Monday to Friday, 8am to 1pm Saturdays with no construction activities on Sundays or public holidays.

The crushing and screening activities are planned for a short duration and only during the construction period when the embankment walls are being constructed. Construction of the embankments walls will range from 15 days at EMB1, 40 days at EMB2 and 20 days at EMB3. In addition crushing will only occur where material is identified in excess of 200 mm for embankment rock fill and it is anticipated that most of the material will be below this sizing. Crushing is required to supply approximately 10,450 t for the road surface for all embankments, this would equate to 10 to 12 days of crushing.

In addition the noise predictions presented in MOD4 were well below the construction criteria listed in the PA conditions with no exceedences predicted. EMM have confirmed that in their opinion these works are still predicted to satisfy the ICNG residential NMLs at all assessment locations. In addition, MOD6/MOD7 has the potential to significantly reduce the TSF2 construction duration and therefore reduce the long-term risk of noise impact at sensitive receivers. Therefore, additional noise impacts at surrounding sensitive receivers from MOD7 is unlikely.

5.2.2 Air Quality

Potential Dust Impacts

Dust will be generated by the use of a dozer to reclaim material, an excavator to manage product stockpiles and mine haul trucks to transport material to the embankments. The crusher would also be a source of dust

although it is not anticipated that it will be required for use during the total duration of the construction period. The crushing and screening activities are planned for a short duration only during the construction period when the embankments are being constructed. Actual construction of the embankments will range from 15 days at EMB1 to 40 days at EMB2 and 20 days at EMB3. In addition crushing will only occur where material is identified in excess of 200 mm for embankment rock fill and it is anticipated that most of the material will be below this requirement. Crushing is required to supply the approximately 10,450 t for the road surface for all embankments, this would equate to 10 to 12 days of crushing.

In additional the source of dust from the transport of rock fill material to the embankments would be reduced in line with the reduction in the transport distance and the removal of the need for double handling of the material.

BHOP engaged Environmental Resources Management Pty Ltd (ERM) (formerly Pacific Environment Pty Ltd), air quality consultant who provided the air quality assessment for MOD4, to review the proposed change from Kintore Pit to BHP Pit, **Appendix C**. The crushing and screening activities were conservatively assessed in MOD4 and the change in the Pit depth will not affect the modelled predictions as assumptions assume a standard 'pit retention' factor regardless of the depth.

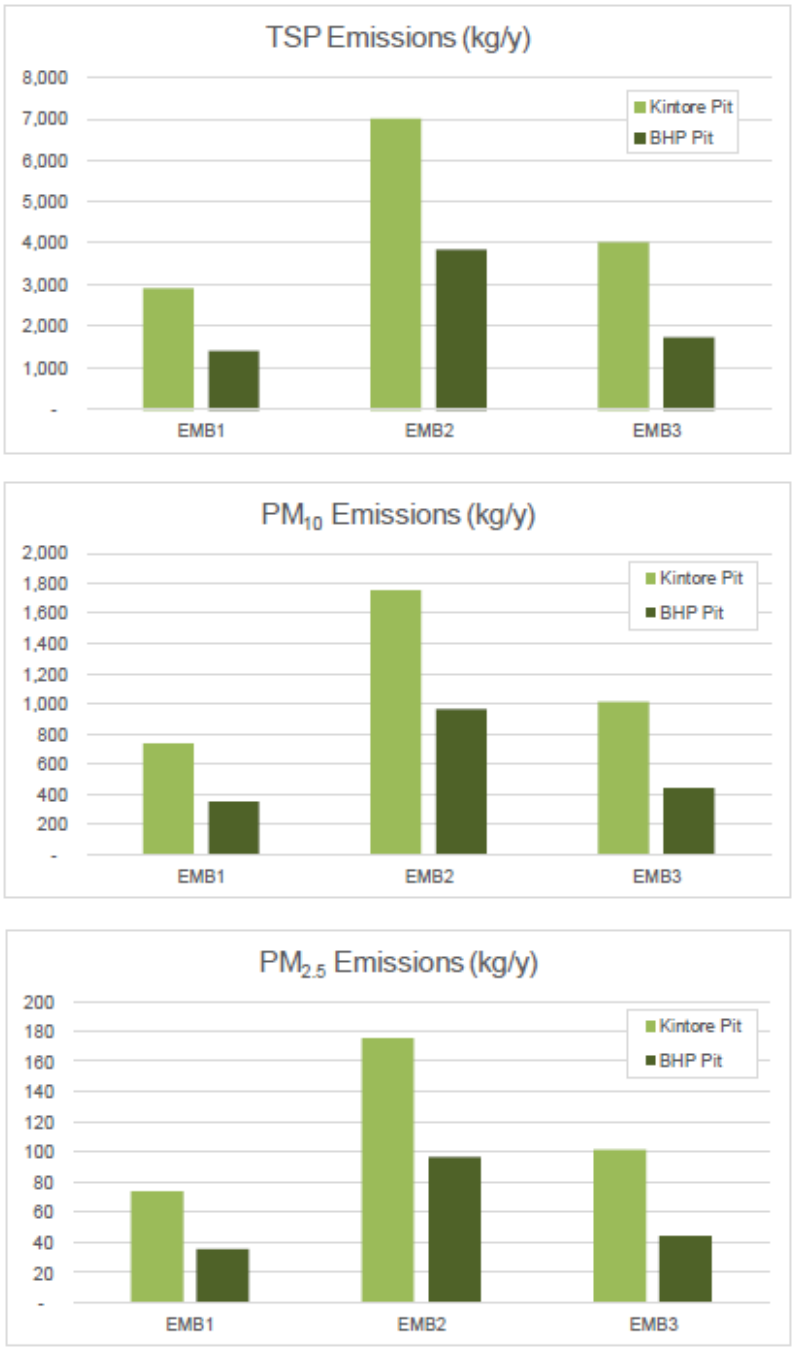
ERM re-estimated the annual emissions and worst case 24-hour emissions for various particulates associated with truck movements carrying rock fill material from either the Kintore Pit or BHP Pit to the embankment emplacement areas using the same calculations and assumptions as used in MOD4. Results are shown in **Table 5-2** and **Figure 5-1** all indicate a significant reduction.

Table 5-2 Emission Estimates for Rock Fill Truck Movements from Different Sources

	Annual Emissions (kg/annum)			Worst case 24-hour emissions (kg/day)*	
	TSP Emissions	PM_{10} Emissions	$PM_{2.5}$ Emissions	PM_{10} Emissions	$PM_{2.5}$ Emissions
Source - Kintore Pit					
Rock fill – haul to E1	2,936	735	74	8,916	892
Rock fill – haul to E2	7,014	1,757	176	10,342	1,034
Rock fill – haul to E3	4,038	1,011	101	8,202	820
Total	**13,987**	**3,503**	**350**	**27,461**	**2,746**
Source – BHP Pit					
Rock fill – haul to E1	1,409	353	35	4,280	428
Rock fill – haul to E2	3,870	969	97	5,706	571
Rock fill – haul to E3	1,755	440	44	3,566	357
Total	**7,034**	**1,762**	**176**	**13,552**	**1,355**

Note: **Annualised worst case 24-hour* emission estimates are reflective of the emission quantity applied in the model for the estimation of peak-24 hour impacts [i.e. assuming short-term peak operations occur on a continuous basis]. These quantities are not reflective of annual emission estimates.

Figure 5-1 Emission Estimates for Rock Fill Truck Movements from Different Sourced Pits



Mitigation Measures

The mobile crusher includes the installation of water sprays within the conveyor cover. In addition dust from material reclaim and the management of stockpiles will be managed via the use of two 15,000 L capacity water trucks. One will be equipped with a fire-fighting canon and will be used to contain any dust generated during recovery of the waste rock material.

BHOP dust management procedures which require dust generating activities to cease in high winds would also apply.

ERM confirmed that the above listed benefits are anticipated to reduce the particulate matter emission inventory compared with that estimated within the original MOD4 air assessment and it was anticipated that the potential for off-site air quality impacts will be reduced compared to the air assessment results predicted in MOD4, and concluded that:

"The hauling of rock fill to the three Embankments forms a material contribution to the total Mine particulate emission inventory.

As such, dependent upon the Embankment being serviced (and the particle size fraction being evaluated), the total Mine particulate emission inventory is anticipated to be reduced by between 6% and 16% through the use of the BHP Pit as an alternative to Kintore Pit."

6.0 PROPOSED STATEMENT OF COMMITMENTS

*This Section lists management commitments to be implemented as a result of the Modification; these are **in addition** to the current Statement of Commitments.*

The proposed mitigation measures to control potential impacts associated with MOD7 activities are outlined in **Table 6-1**. Some of these measures are already included in site mitigation measures and are not additional to the current Statement of Commitments.

Table 6-1 Proposed Mitigation Measures

Mitigation Measure	New Measure	Already Included in Statement of Commitments
NOISE		
Use of construction hours for the activities.		✔
Use of 'squawker' type reverse alarms on vehicles used on site.		✔
Current noise abatement bund (4 m) along the Haul Road.		✔
Regular reinforcement at pre-starts and toolbox talks of the need to minimise noise.		✔
DUST		
Water sprays and water truck.		✔
Installed water sprays on the mobile crusher.	✔	
Management of potential dust generating activities on wind days would be addressed via current procedures which include suspension of works if required (ie exceeding 40 kph).		✔

7.0 CONCLUSION

This section provides a justification for the Modification as sought and concluding comments.

BHOP is seeking approval for a minor Modification (MOD7) to the Project Approval to:

- Utilise the material currently stored in BHP Pit for embankment construction; and
- Conduct sorting, crushing and screening activities in BHP Pit.

BHOP has committed to continue implementing existing mitigation and management measures and, where required, implement additional measures to minimise potential impacts as a result of this Modification. This SEE has demonstrated that, with these measures in place, the proposed Modification can be undertaken within acceptable standards and with no significant impacts to the environment or the community. Potential noise and dust risks will be reduced as a result of this Modification.

The proposed minor Modification would result in a range of benefits, including:

- Reduction in travel time for transporting material to embankment locations;
- Reduction in potential dust exposures due to shorter travel distance;
- Reduction in potential noise exposures due to the potential to shorten the construction time;
- Minimise double-handling on feed waste rock and product stockpiles;
- An increase in separation distance from the site boundary compared with the scenario anticipated within the original MOD4 application;
- Reduction in construction time for the embankment works;
- Reduction in diesel fuel usage; and
- Reduction in costs for embankment works.

It is considered that the proposed Modification could be implemented with no additional impacts and that potential environment risks identified in MOD4 can continue to be managed through simple design features and current control measures.

8.0 DEFINITIONS AND ACRONYMS

BHCC	Broken Hill City Council
BHOP	Broken Hill Operations Pty Ltd
CBH	CBH Resources Ltd
CML7	Consolidated Mine Lease 7
dB	Decibels – (A) = expression of the relative loudness of sounds in air as perceived by the human ear
dB L Aeq (15 min)	Equivalent continuous noise level over a 15 minute period
DCP	BHCC Development Control Plan
DPE	NSW Department of Planning and Environment
DPI-Water	NSW Department of Industry - Water
DRG	NSW Division of Resources and Geoscience
EA	Original Environment Assessment
EMB1	Blackwood Pit TSF2 Embankment 1
EMB2	Blackwood Pit TSF2 Embankment 2
EMB3	Blackwood Pit TSF2 Embankment 3
EMM	EMM Consulting Pty ltd
EP&A Act	NSW *Environment Planning & Assessment Act 1979*
EPA	NSW Environment Protection Authority
EPL	Environment Protection License
ERM	Environmental Resources Management Pty Ltd
g	grams
Ha	hectare
ICNG	NSW DECC Interim Construction Noise Guideline, 2009
kg	kilogram
km	kilometres
kph	kilometres per hour
L	litre
LEP	BHCC Local Environment Plan 2013

m	metre
m^2	metres squared
m^3	cubic metres
MOD1	Relocation of the main ventilation shaft
MOD2	Crushing of ore permitted to occur at any time
MOD3	Extend underground mining into Block 7 (includes the Zinc Lodes)
MOD4	Install a Concrete Batching Plant and the construction of embankments to extend the life of TSF2
MOD5	Stores Warehouse extension, installation of a cement silo and adjustments to air quality monitoring requirements.
MOD6	Proposed Modification for storing tailing in Kintore Pit (TSF3) yet to be submitted to DPE for determination
MOP	Mining Operations Plan
MPL	Mining Purpose Lease
NEPM	National Environment Protection Measure
NES	National Environmental Significance
NMLs	Noise Management Levels
Normandy	Normandy Mining Investments
NSW	New South Wales
PA	Project Approval 07_0018
Pb	lead
Perilya	Perilya Broken Hill Operations Pty Ltd
POEO Act	NSW *Protection of the Environment Operations Act, 1997*
PM_{10}	Particulate matter up to size 10 microns
$PM_{2.5}$	Particulate matter up to size 2.5 microns
PPR	BHOP Preferred Project Report, 2010
Rasp Mine	the Mine
SEE	Statement of Environment Effects
SEPP	State Environment Planning Policy
SSD	State Significant Development
t	tonnes
tpa	tonnes per annum
tph	tonnes per hour
TSP	Total suspended particles
TSF1	Historic tailing storage facility
TSF2	Blackwood Pit tailing storage facility
U/G	Underground
WLL	Western Lands Lease
Zn	zinc

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Appendix A

MOD7 Key Issues for Consideration, DPE – Letter dated 25 June 2019

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Appendix B

Letter Report –

EMM Consulting Pty Ltd,

25 June 2019

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Appendix C

Letter Report –

Environmental Resources Management Pty Ltd,

26 June 2019