

HERA MINE ANNUAL REVIEW

**PROJECT APPROVAL 10_0191
MINING LEASE 1686
MINING LEASE 1746**

For the period
1 July 2020 to 30 June 2021



Name of Operation	HERA MINE
Name of Operator	Hera Resources Pty Ltd
Development Consent / Project Approval #	PA 10_0191
Name of holder of development consent / project approval	Hera Resources Pty Ltd
Mining Lease #	MINING LEASE 1686 MINING LEASE 1746
Name of Mining Lease Holder:	Hera Resources Pty Ltd
Water Licence #	WAL 43173
Name of holder of water licence	Aurelia Metals Ltd
MOP Commencement Date:	1 January 2020
MOP Completion Date:	31 December 2022
Annual Review Commencement Date:	1 July 2020
Annual Review Completion Date:	30 June 2021
<p>I, Jonathon Thompson, certify that this audit report is a true and accurate record of the compliance status of Hera Mine for the period 1 July 2020 to 30 June 2021 and that I am authorised to make this statement on behalf of Hera Resources Pty Ltd.</p> <p><i>Note.</i></p> <p>a) <i>The Annual Review is an ‘environmental audit’ for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p>b) <i>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents – maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of Authorised Reporting Officer:	Jonathon Thompson
Title of Authorised Reporting Officer:	Group Manager - Environment
Signature of Authorised Reporting Officer:	
Date:	16 August 2021

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Appendix C	Attended Noise Monitoring Report
Appendix D	Capillary Rise Assessment Report

ABBREVIATIONS

µg	Micrograms
µm	Micrometre
CCC	Community Consultative Committee
dB	Decibels
DDG	Dust Deposition Gauges
DoI Water	Department of Industry - Water (former)
DPE	Department of Planning and Environment (former)
DPIE	Department of Planning, Industry and Environment
EA	Environmental Assessment
EPA	Environment Protection Authority
EPL	Environment Protection Licence
ha	Hectare
HVAS	High Volume Air Sampler
IA	Inaudible
m ³	Cubic Metre
ML	Mining Lease
mm/s	Millimetre per second
MOP	Mining Operations Plan
NRAR	Natural Resources Access Regulator (<i>formally DoI Water</i>)
NR	No result
NSW	New South Wales
NSW EES	NSW Environment, Energy and Science (<i>formally OEH</i>)
OEH	<i>Former Office of Environment and Heritage</i>
Oz	Ounces
PA	Project Approval
PM ₁₀	Particulate Matter less than 10µm
SDS	Safety Data Sheet
t	Tonnes
tpa	Tonnes per annum
TSF	Tailings Storage Facility
TSP	Total Suspended Particulate
WAD Cn	Weak Acid Dissociable Cyanide
WAL	Water Access Licence
WLL	Western Lands Lease
WREA	Waste Rock Emplacement Area

1 Statement of Compliance

A summary of compliance at Hera Mine during the 2020-2021 reporting period is provided in **Table 1**.

Table 1 Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
PA 10_0191	No
EPL 20179	Yes
Mining Lease 1686	Yes
Mining Lease 1746	Yes
Water Access Licence 43173	Yes


A summary of the non-compliances during the reporting period have been summarised in **Table 2**. The non-compliances during the 2020-2021 reporting period are discussed further in **Section 11**. The non-compliance categories are described in **Table 3**.

Table 2 Non-Compliances During the Reporting Period

Relevant Approval	Condition No.	Condition Description Summary	Compliance Status	Comments	Where Addressed
PA10_0191	Schedule 2, Cond. 2	Ensure that the development is carried out in general accordance with the EA.	Non-compliant	Trucking raw water from offsite sources onto site for operational mining purposes. This was reported to relevant agencies.	Section 7.2.3
PA10_0191	Schedule 3, Condition 13	Ensure that all point-source discharge locations comply with the discharge concentrations applicable under the <i>Protection of the Environment (Clean Air) Regulation 2010</i>	Non-compliant	On 1 September 2020, a result of 0.26 mg/m ³ Mercury was recorded from the Gold Room Scrubber Stack. A limit of 0.2 mg/m ³ applies to Mercury. The incident was reported to relevant agencies.	Section 6.2.3

Table 3 Compliances Status Categories

Risk Level	Colour Code	Description
High	Non-Compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-Compliant	Non-compliance with potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-Compliant	Non-compliance with potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-Compliant	Non-compliance which does not result in any risk of environmental harm

	Hera Annual Review 2020-2021	
	Author	B Topp (SLR) and J.Thompson (Hera)
	Reporting period	1 July 2020 to 30 June 2021

2 Introduction

2.1 Summary

Hera Mine (Hera) is an underground metalliferous mine owned by Hera Resources Pty Ltd (Hera Resources), a wholly owned subsidiary of Aurelia Metals Limited (Aurelia). The mine is located approximately 100km southeast of Cobar and approximately 4km south of Nymagee in the central west of New South Wales (NSW) (refer **Figure 1**). The site consists of an underground mine, a run-of-mine (ROM) pad, temporary waste rock emplacement (WRE), processing plant, tailings storage facility (TSF), and associated infrastructure and ancillary activities (refer **Figure 2**).

The site operates in accordance with Project Approval (PA) 10_0191 which was issued by the former Department of Planning and Infrastructure (now Department of Planning, Industry and Environment [DPIE]) on 31 July 2012 under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). PA 10_0191 has since been modified six times with the sixth modification (MOD 6) submitted and approved during the reporting period. In addition, several local development consents have been issued relating to Hera. Development Consent 2012/LD-00004 was granted by Cobar Shire Council on 14 March 2012 for the mine camp, including accommodation facilities, ablution facilities, a water treatment facility, communal facilities and a communal car park. Development Consent 2019/LD-00027 was granted by Cobar Shire Council on 13 December 2019 for the installation of the Nymagee Pipeline allowing for the pumping of water from the historic Nymagee Copper Mine to the Hera Mine for use in operations. Furthermore, during the reporting period, an application was submitted to Cobar Shire Council seeking approval to expand the Hera Village. Hera Resources is expecting this to be determined early in FY22.

The site also operates in accordance with Mining Lease (ML) 1686 (issued 16 May 2013) and ML 1746 (issued 7 December 2016) issued under the *Mining Act 1992* (Mining Act), as well as Environment Protection Licence (EPL) 20179.

This Annual Review has been prepared for the period from 1 July 2020 to 30 June 2021 (herein referred to as the reporting period), and has been prepared in accordance with the following:

- Schedule 5, Condition 4 of PA 10_0191;
- Condition 4 of ML 1686;
- Condition 3 of ML 1746; and
- The NSW Government Guideline, Annual Review Guideline (October 2015).

Copies of this Annual Review are distributed to DIPE, Resources Regulator, Natural Resources Access Regulator (NRAR), Environment Protection Authority (EPA), NSW Environment, Biodiversity Conservation and Science Directorate, Department of Industry – Crown Lands (DoI Crown Lands), Cobar Shire Council, and Bogan Shire Council. Additionally, a copy will be made available on the Aurelia Metals website for the general public.

2.2 Mine Contacts

Table 4 lists the site contacts for Hera.

Table 4 Mine Contacts

Name	Role	Phone number	Email Address
Robert Walker	General Manager	02 6837 3006	robert.walker@aureliametals.com.au
Jonathon Thompson	Group Manager - Environment	0488 065 144	Jonathon.Thompson@aureliametals.com.au

 	Hera Annual Review 2020-2021	
	Author	B Topp (SLR) and J.Thompson (Hera)
	Reporting period	1 July 2020 to 30 June 2021

General Enquiries/ Complaints	-	1300 016 240	complaints@aureliametals.com.au
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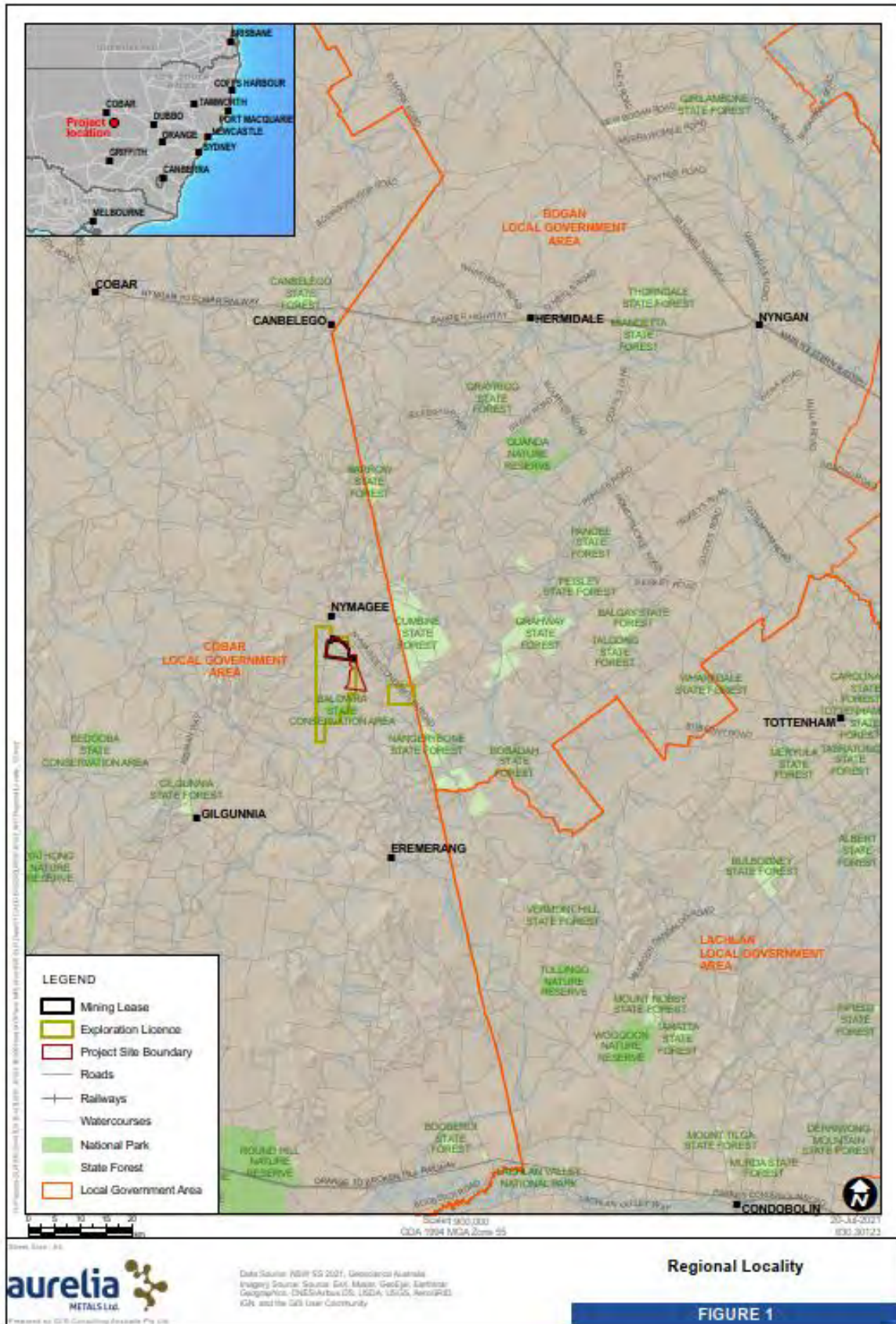


Figure 1 Regional Locality

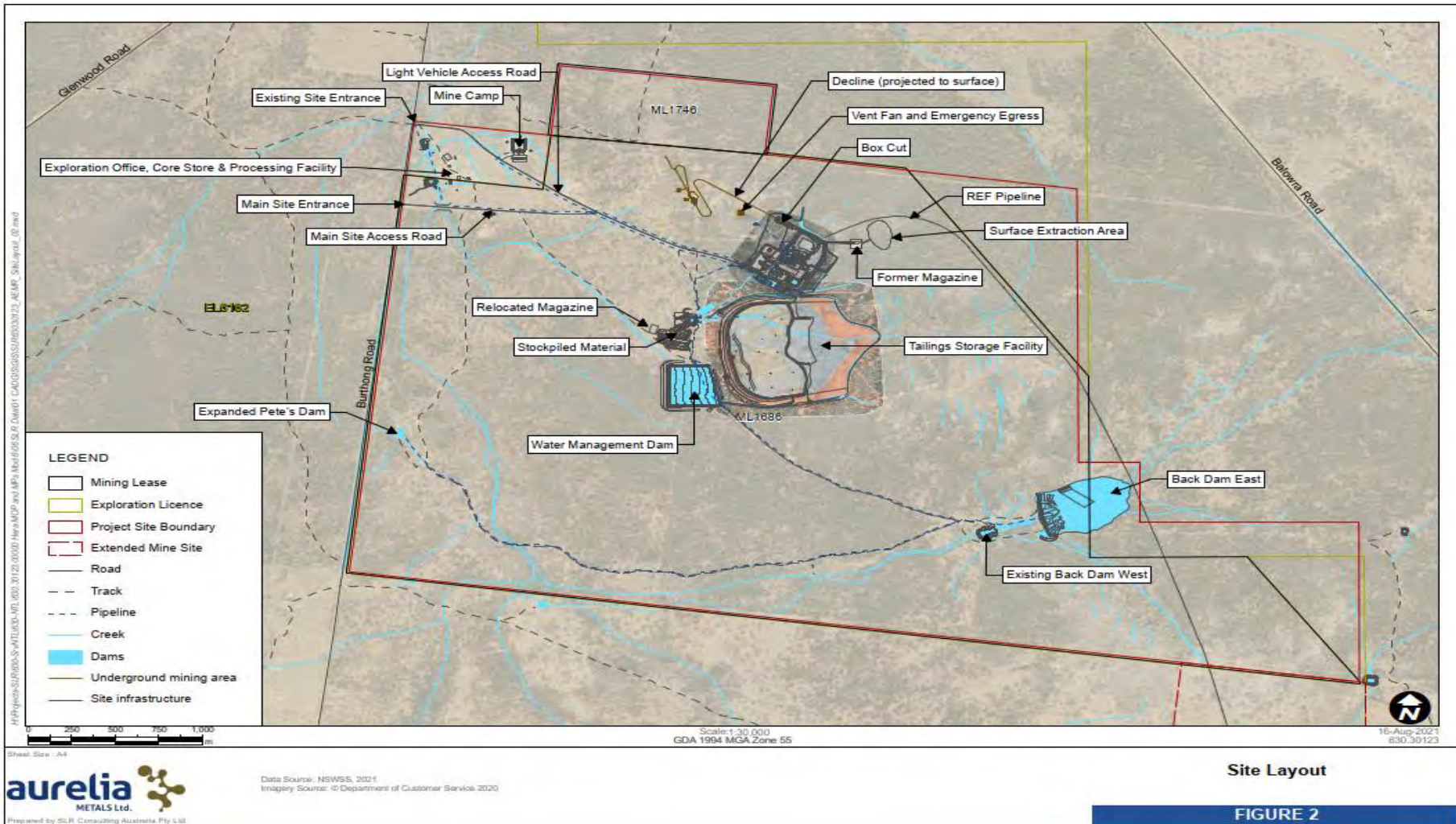


Figure 2 Site Layout

3 Approvals

3.1 Overview

Table 5 lists the relevant consents, leases and licences associated with Hera. These are discussed in further detail in the following sections.

Table 5 Consents, Leases and Licences

Consent/Lease/Licence	Licence Number	Date of Issue	Expiry	Relevant Authority
Project Approval	10_0191	31 July 2012	31 December 2025	DPIE
Development Consent	2012/LD-00004	14 March 2012	N/A	Cobar Shire Council
Development Consent	2019/LD-00027	13 December 2019	N/A	Cobar Shire Council
Mining Lease	ML 1686	16 May 2013	16 May 2034	Resources Regulator
Mining Lease	ML 1746	7 December 2016	7 December 2037	Resources Regulator
Environment Protection Licence	20179	18 March 2013	N/A - Anniversary date 18 March	EPA
Mining Operations Plan	N/A	1 January 2020	31 December 2022	Resources Regulator
Water Access Licence (WAL)	WAL 43173	6 March 2020	N/A	NRAR
Western Land Lease	WLL 2455	April 1911	Perpetual Lease	Dol – Crown Lands
Dangerous Goods Licence	35/038197	22 November 2011	Expires: N/A	SafeWork NSW
Explosives Licence	XSTR200011	2012	6 June 2022	SafeWork NSW
Radiation Licence	5066818	16 April 2019	N/A - Anniversary date 30 July	EPA

3.2 Project Approval

3.2.1 PA 10_0191

PA 10_0191 (as modified) allows for the processing of up to 505,000 tonnes of ore, and transportation of up to 60,000 tonnes of concentrate from the site per year, until 31 December 2025. Six modifications to PA 10_0191 have been approved, as summarised below:

- MOD 1 – Extension of onsite powerlines from the surface ventilation fan to the mine camp (determined 11 July 2013);
- MOD 2 – Modification to the approved haulage route along Nymagee-Hermidale Road (determined 21 November 2014);
- MOD 3 – Increase to the ore production rate and construction of supporting infrastructure (determined 25 February 2016);
- MOD 4 – Extension to the approved project boundary to extract and process an additional 62,000 t of gold-zinc-lead ore (determined 21 September 2016);
- MOD 5 - Increasing the rate of transportation of concentrate from Hera to the Hermidale rail siding from 50,000 t per calendar year to 60,000 t per calendar year, installation of a 13.7 hectare (ha), 204 mega litre (ML) crest height Water Management Dam to act as an external decant pond for the existing TSF, receipt of water from dewatering of the Nymagee Copper Mine for use in processing operations at Hera or

evaporation within the Water Management Dam, and increasing the approved maximum elevation of the Southern WREA from 10m above ground level to 15m above ground level, or approximately 350m AHD (determined 3 December 2019); and

MOD 6 – Transportation of up to 100,000tpa from the Hera Mine to the Peak Mine, a distance of 94km by road, with backloading of a similar amount of waste rock from the Peak Mine to the Hera Mine, placement of tailings underground for stope backfilling operations, establishment and use of a Surface Extraction Area and associated relocation of the existing magazine, amendment of the current tailings discharge point Weak Acid Dissociable (WAD) cyanide limit from 10mg/L to a new limit of 20mg/L (90th percentile) and 30mg/L (maximum), extension of the current approval for mining operations at the Hera Mine from 31 December 2022 to 31 December 2025, extension of the Hera Mine Site boundary to incorporate additional land and groundwater resources, extension of the existing water pipeline network and importation and batch processing of a 20,000t bulk sample and importation of waste rock and water from the Federation Exploration Decline Program (determined 18 June 2021).

The conditions of PA 10_0191 as relevant to this Annual Review, and where they have been addressed in this document, are provided in **Table 6** below.

Table 6 PA10_0191 Annual Review Conditions

Condition	Where Addressed
<p>Monitoring of Concentrate Transport</p> <p>37. The Proponent shall:</p> <p>(a) keep accurate records of the:</p> <p>(i) amount of lead and zinc concentrate transported from the site (on a monthly basis);</p> <p>(ii) amount of ore transported from the site to Peak Mine (on a monthly basis);</p> <p>(iii) amount of waste rock transported to the site (on a monthly basis);</p> <p>(iv) the date and time of loaded truck movements from the site; and</p> <p>(b) provide the Secretary with a summary of these truck movements in the Annual Review.</p>	Section 6.9
<p>Annual Review</p> <p>Schedule 5</p> <p>4. By the end of December each year (or other such timing as agreed by the Secretary), the Proponent shall review the environmental performance of the project to the satisfaction of the Secretary. This review must:</p> <p>(a) describe the development (including any rehabilitation) that was carried out in the past year, and the development that is proposed to be carried out over the next year;</p>	Section 4
<p>(b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:</p> <p>(i) the relevant statutory requirements, limits or performance measures/criteria;</p> <p>(ii) requirements of any plan or program required under this approval;</p> <p>(iii) the monitoring results of previous years; and</p> <p>(iv) the relevant predictions in the EA;</p>	Section 6
<p>(c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;</p>	Sections 1 and 11
<p>(d) identify any trends in the monitoring data over the life of the project;</p>	Section 6
<p>(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and</p>	Section 6
<p>(f) describe what measures will be implemented over the next year to improve the environmental performance of the project.</p>	Section 6
<p>(g) report on water extracted from the site each year (direct and indirect) including water taken under each water licence.</p>	Section 7

ACCESS TO INFORMATION

Section 9.2

11. Prior to the commencement of construction on the site, the Proponent shall:
 (a) make copies of the following publicly available on its website:
 (vii) the annual reviews required under this approval; and
 (b) keep this information up-to-date.

3.2.2 DA 2012/LD-00004

Development consent 2012/LD-00004 was granted by Cobar Shire Council on 14 March 2012 for the construction and use of a mine camp, including accommodation facilities, ablution facilities, a water treatment facility, communal facilities and a communal car park.

3.2.3 DA 2019/LD-00027

Development consent 2019/LD-00027 was granted by Cobar Shire Council on 13 December 2019 for the construction of the Nymagee pipeline. The Nymagee pipeline is connected to the historic Nymagee Copper Mine and water is transferred to Hera for use in operations.

3.3 Leases

Hera Resources currently holds two mining leases (ML 1686 and ML 1746).

3.4 Licences

3.4.1 EPL 20179

Hera operates under EPL 20179, with an anniversary date of 18 March. Monitoring results are reported to the EPA as part of the EPL Annual Return. During the reporting period, no Section 58 Licence Variations were sought, and no Section 91 Clean Up Notices were received from the EPA.

The environmental reporting and monitoring activities undertaken at Hera as required under EPL 20179, are discussed in **Section 6** and **Section 7**.

3.4.2 Water Access Licences

Hera currently holds WAL 43173 which permits extraction of up to 543 ML per year.

Previously Hera held WAL 28773 and WAL 30298 which permitted extraction of up to 540ML and 3ML per year respectively.

3.4.3 Other Licences

Hera currently holds explosives licence XSTR200011, Dangerous Goods Licence 35/038197 and Radiation Licence 5066818.

3.5 Other Approvals

3.5.1 MOP

Hera operates in accordance with the approved Mining Operations Plan (MOP) which covers the period from 1 January 2020 to 31 December 2022. An amended MOP was submitted on 5 August 2021 to include operations associated with PA 10_0191 MOD 6 and the Federation Exploration Decline Review of Environmental Factors (REF) (refer **Section 3.2.1**). The MOP is awaiting determination.

Hera Annual Review 2020-2021	
Author	B Topp (SLR) and J.Thompson (Hera)
Reporting period	1 July 2020 to 30 June 2021

3.5.2 WLL 2455

The Hera Mine is located on land held by Hera Resources under Western Lands Lease No. WLL 2455, granted under the *Western Lands Act 1901* and managed by DoI Crown Lands.

	Hera Annual Review 2020-2021	
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	Reporting period	1 July 2020 to 30 June 2021

4 Operations Summary

4.1 Mining Operations

4.1.1 Exploration

Hera conducts exploration activities within ML 1686 and ML 1746 in accordance with the approved MOP.

During the reporting period, the following exploration activities were undertaken:

- Thirteen RC holes drilled.

No exploration boreholes were rehabilitated during the reporting period. Rehabilitation works have been undertaken on sites and tracks where it has been deemed no further exploration activities will be undertaken. Further rehabilitation works are ongoing as areas are sterilised for exploration purposes.

4.1.2 Land Preparation

Land preparation was undertaken in accordance with ESG5 for the majority of surface exploration drilling, unless drilling activities were designed and completed within pre-disturbed areas. Land preparation included clearing of access tracks and drill sites (described above) using a combination of loader, dozer to allow access and safe operation of drilling equipment and an excavator for the construction of inground sumps for the containment of drilling fluids used and produced during the drilling process.

4.1.3 Mining

Mining for the period was undertaken using conventional bench stoping mining techniques. **Figure 3** presents a schematic overview of this mining method. Stope voids are backfilled with waste rock material from concurrent underground development and, if required, additional waste rock material is transported from the Waste Rock Emplacement Area (WREA) on the surface.

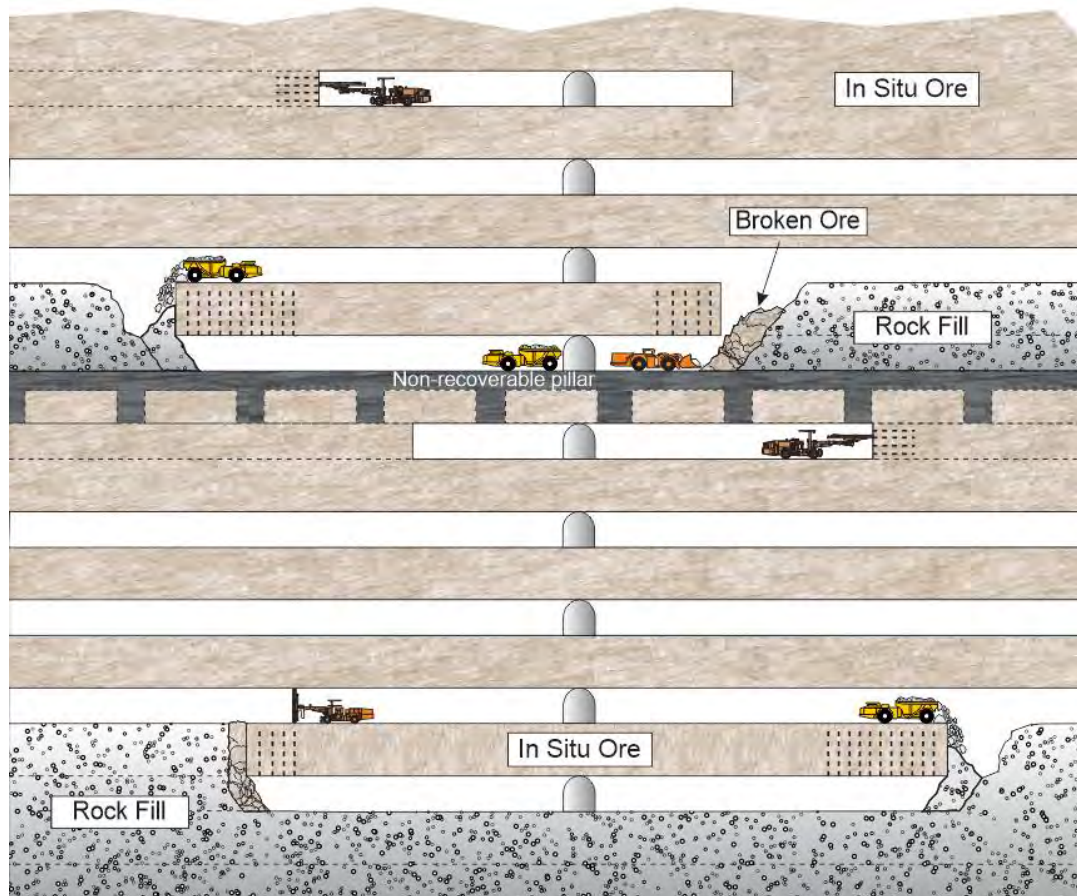


Figure 3 Schematic of bench stoping mining method

Mining activities conducted during the financial year period (1 July 2020 to 30 June 2021) are summarised in **Table 7**.

Table 7 Production Summary for the 2020-2021 Financial Year Period

Material	Approved Limit (PA 10_0191)	FY 2021 MOP Prediction	2019-2020 FY (Actual)	2020-2021 FY (Actual)	2021-2022 FY (Forecast)
Waste Rock	N/A	-62,000 t	-98,856 t	0 t	0 t
ROM Ore	505,000 t	490,000 t	410,495 t	463,343 t	463,000 t
Tailings (Solids)	N/A	407,000 t	369,391 t	402,436 t	383,000 t
Saleable Product (Gold)	N/A	28,000 oz	45,031 oz	31,369 oz	22,500 oz
Saleable Product (Lead / Zinc Bulk Concentrate)*	N/A	51,000 t	41,859 t	45,596 t	51,500 t

* No annual production limit for concentrate however can only transport up to 60,000tpa (calendar year).

The volume of ROM ore produced during the 2020-2021 financial year (463,343 t) was within the approved 505,000 t limit stipulated in PA 10_0191. The volume of ROM ore, tailings and saleable product (Lead/Zinc bulk concentrate) were higher than the 2019-2020 financial year while saleable product gold was down on the previous reporting period. The volumes produced during the 2020-2021 financial year were less than the volumes predicted in the MOP however saleable gold was higher.

No waste rock was brought to the surface during the reporting period, as described in **Table 7**. No waste rock is planned to be brought to surface in the following reporting period, as all waste will be used in backfilling stopes. The Surface Extraction Area approved in PA10_0191 MOD6 will provide waste rock for underground backfilling operations were there are deficiencies.

4.2 Other Operations

4.2.1 Mineral Processing and Transport

During the 2020-2021 financial year, approximately 402,436 t of tailings (solids), 31,369 oz of gold doré (unrefined bars), and 45,596 t of lead/zinc bulk concentrate were produced from the processing plant. All tailings were disposed of in the Tailings Storage Facility (TSF).

Gold doré is transported offsite and zinc/lead concentrate is transported by road to the Hermidale rail siding. During the reporting period 45,958 t of lead/zinc bulk concentrate was transported from the site (refer **Section 6.9**).

4.2.2 Stockpiled Materials

Ore is not stockpiled at the site and is processed without delay. Waste rock from the underground is temporarily stockpiled in the WREA when required, and soil is stockpiled around the site. Waste rock and soil stockpile activities in the reporting period are summarised in **Table 8**.

Table 8 Stockpile details for the reporting period

Material	Approved Limit (PA 10_0191)	Stockpiles Previous Reporting Period (Actual)	Stockpiles this Reporting Period (Actual)	Next Reporting Period (Forecast)
Waste Rock stockpiled in WRE Area	n/a	26,280 m ³ (surveyed 30 Jun 20)	0 m ³	0 m ³
Soil Stockpiled	n/a	180,941 m ³	180,941 m ³	183,461 m ³
Soil Used	n/a	0 m ³	0 m ³	0 m ³

No waste rock is planned to be brought to the surface during the following reporting period. No soil was used during the reporting period or is planned to be used during the next reporting period.

4.2.3 Construction

No construction works were carried out during the 2020-2021 reporting period.

4.2.4 Hours of Operation

During the reporting period, all activities were undertaken in accordance with the approved hours of operation. Approved hours of operation are:

- Vegetation clearing and topsoil stripping - 7am to 6pm, 7 days per week;
- Construction - 24 hours, 7 days per week;
- Construction of the Water Management Dam – daylight hours, 7 days per week;
- Mining, maintenance and processing operations – 24 hours, 7 days per week;
- Rehabilitation - Day / Evening;
- Transportation of lead and zinc concentrate and gold doré from the site – daylight hours, 7 days per week;
- Transportation of ore from the site – daylight hours, 7 days per week; and
- Transportation of waste rock to the site – daylight hours, 7 days per week.

4.2.5 Waste Management

Waste management for the period was undertaken in accordance with the commitments made in the MOP. Waste materials are recycled where possible. All waste materials removed from site are done so by licensed contractors. A summary of waste disposal during the reporting period is summarised in **Table 9**.

Table 9 Waste Management during the reporting period

Waste Stream	Description	Quantity (t)
General waste	General waste for disposal.	47.48
General recyclables	General mixed recyclables.	2.325
Hazardous waste disposal	Oily Rags/absorbents, absorbent contaminated waste, chemicals, pond liners.	0.612
Hazardous waste recycled	Oil Filters, waste grease, solvents	51.24

4.2.6 Hazardous Material Management

Hazardous materials are managed according to the *Hazardous Materials Management Plan*. The *Hazardous Materials Management Plan* is currently being revised and updated as part of the MOD 6 work. It will soon be submitted to the relevant government agencies for consultation and approval.

Hazardous Materials management during the reporting period has included the following:

- Regular area-specific environmental inspections to ensure all hazardous materials are stored in accordance with relevant legislation and regulations;
- Purchase of bunds suitable for storage of IBCs and drums;
- Explosives are stored in a fit-for-purpose magazine;
- Updating of the chemical register as required;
- Updating of Safety Data Sheets (SDS) as required;
- Training of staff and contractors during inductions or as required;
- Maintaining the licence to store hazardous and explosive materials during the period; and
- The classification of some materials was reviewed and redundant materials removed from the system.

4.3 Next Reporting Period

Mining and exploration activities are expected to continue during the following reporting period in accordance with the approved MOP.

In the next reporting period, the Surface Extraction Area described in MOD 6 will be established and utilised. It will enable the extraction of non-acid forming material suitable for backfilling operations, as well as other on-site uses. Furthermore, the Magazine will be relocated to the location proposed in **Figure 2**. This location is within the existing disturbance area associated with the soil stockpiles.

When required, the Hera Environmental Management Plans will be updated and submitted to the relevant government departments for consultation and approval.

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5 Actions Required from Previous Annual Reviews

The 2019-2020 Annual Review was supplied to the DPIE, Resources Regulator, EPA, Cobar Shire Council and Bogan Shire Council. An approval letter was received from DPIE noting that the document was satisfactory. Commitments made by Hera Resources in the previous Annual Review, and their status, are provided in **Table 10**.

Table 10 Actions Required from 2019-2020 Annual Review

Action Required from Previous Annual Review	Action Taken by Operator	Where discussed
Comments from DPIE		
The document is satisfactory	N/A	-
Comments from Resources Regulator		
No comment received	N/A	-
Commitments made by Hera in previous Annual Review		
Following approval of MOD 5, Hera Resources will update all environmental management plans, and submit for consultation with the relevant agencies.	All environmental management plans are currently being updated as part of the MOD 6 work. They will be submitted to the relevant agencies for consultation when complete.	Sections 6 and 7
Install a 13.7 ha, 204 to embankment crest (168 to spillway crest) ML Water Management Dam to act as an external decant pond for the existing TSF.	The dam has not been constructed to date as it has not been required.	Section 7.2.1

6 Environmental Performance

This section outlines the environmental performance of the mine during the reporting period. Environmental management, monitoring and key issues have been outlined for the relevant environmental aspects. It should be noted that as the mine is a hard rock metalliferous mine, issues such as subsidence, spontaneous combustion, and methane drainage/ventilation (requirements of the Annual Review Guideline) are not applicable.

6.1 Meteorology

In accordance with Schedule 3, Condition 16 of PA 10_0191, and Condition M4 of EPL 20179, Hera continued to operate the meteorological station throughout the reporting period. The meteorological station is located in the north-west of the site (refer **Figure 5**), and monitors rainfall, wind speed, wind direction, temperature, sigma theta, solar radiation and relative humidity.

In general, the 2020-2021 reporting period was wetter when compared to the previous reporting period due to consistent rainfall throughout the reporting period. Total annual rainfall was 470.6 mm, compared to 377 mm during the previous reporting period. The daily minimum and maximum 2m temperatures ranged from -7.2°C to 43.9°C respectively, with an average daily maximum of 24.3°C. Average daily wind speeds ranged from 5.4 to 10.2 km/h, with a maximum wind gust of 52.1 km/h.

Rainfall and wind speed data has been summarised in **Figure 4**. Temperature data has been summarised in **Figure 6**, and wind direction data has been summarised in **Figure 7**. The meteorological monitoring results provide context for the environmental monitoring and management discussed further in this document.

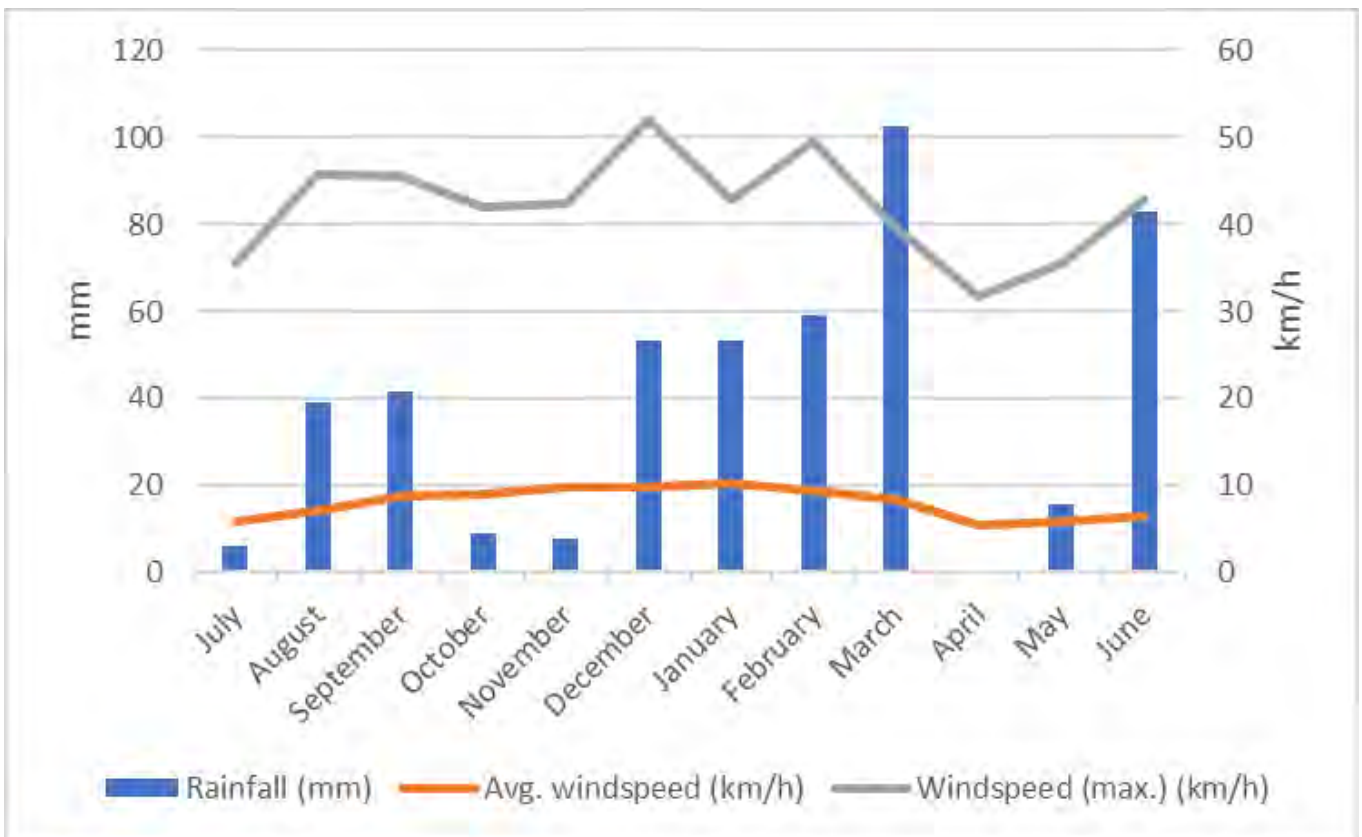


Figure 4 Summary of the Rainfall and Windspeed conditions for the reporting period

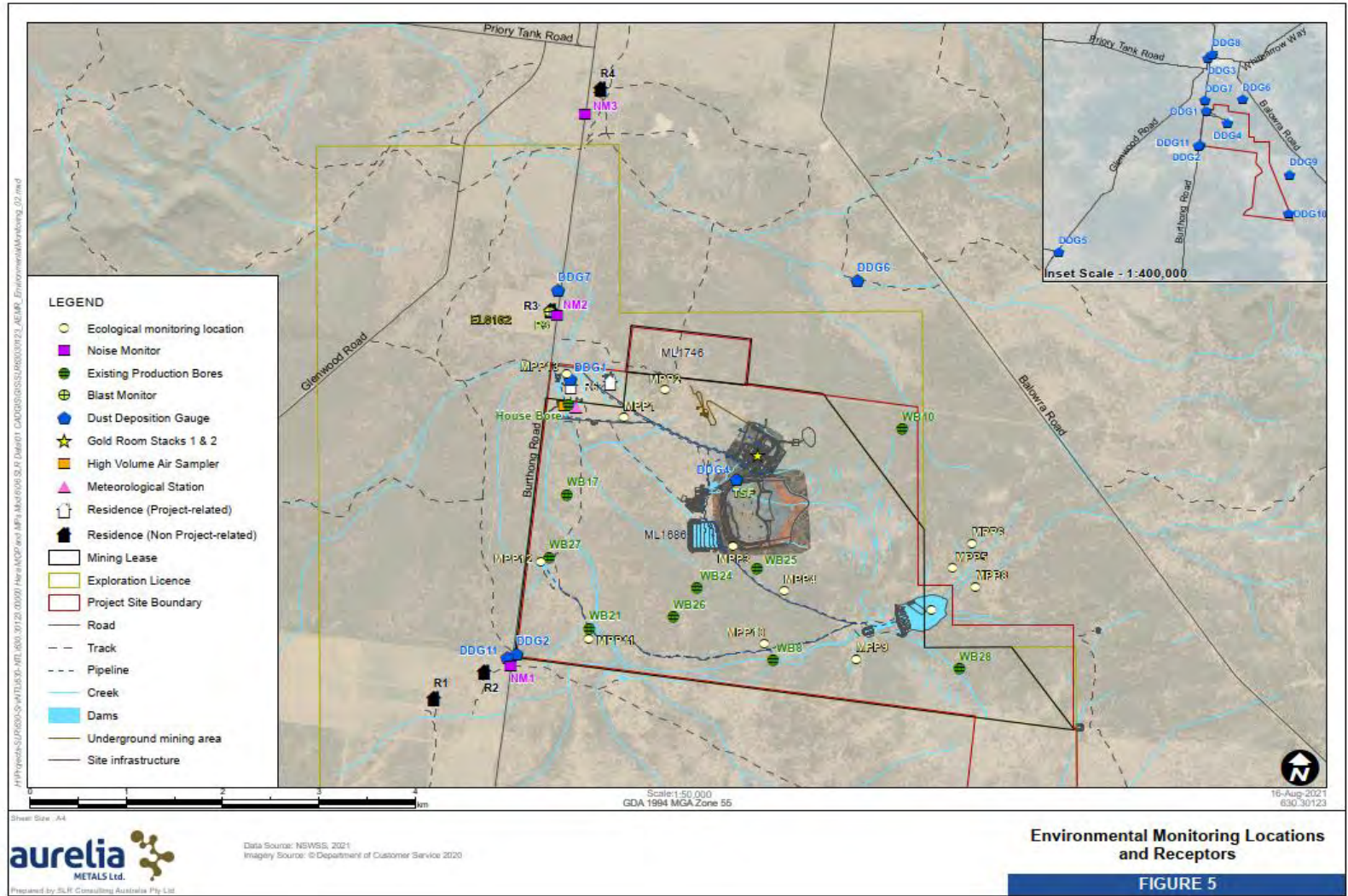


Figure 5 Environmental Monitoring Locations and Receptors

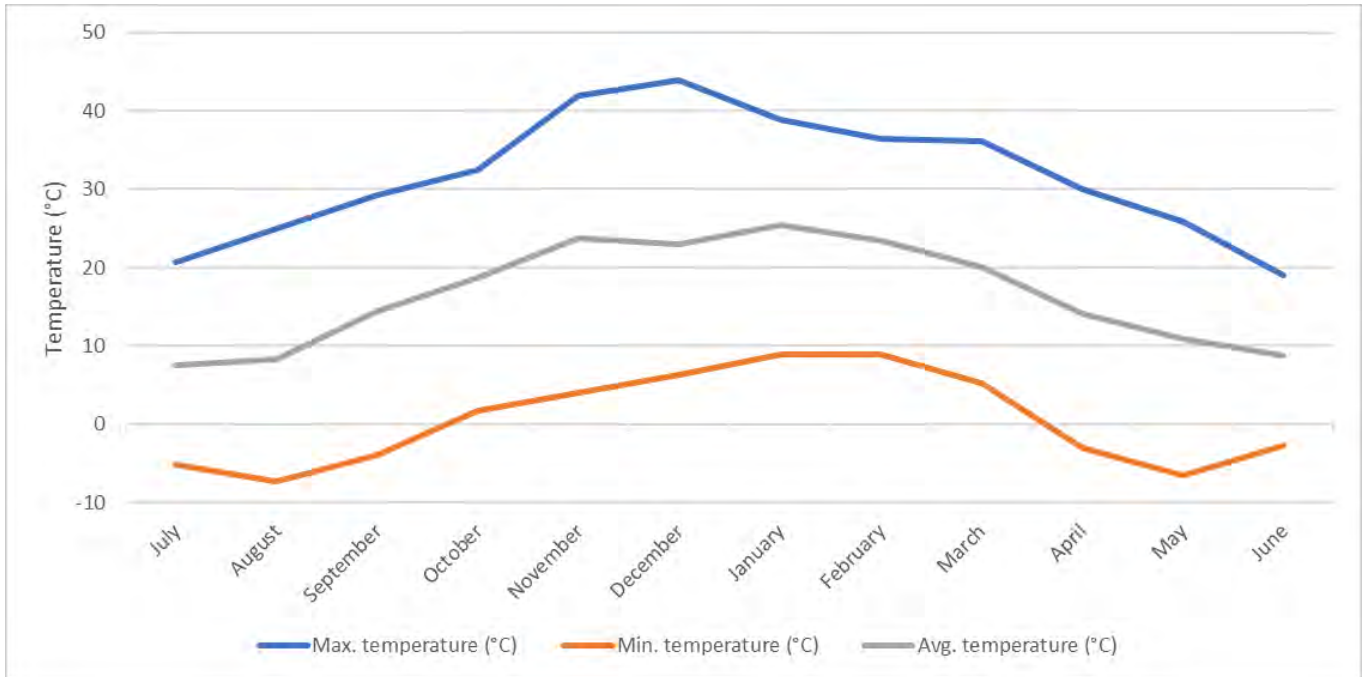


Figure 6 Temperature Summary for the Reporting Period

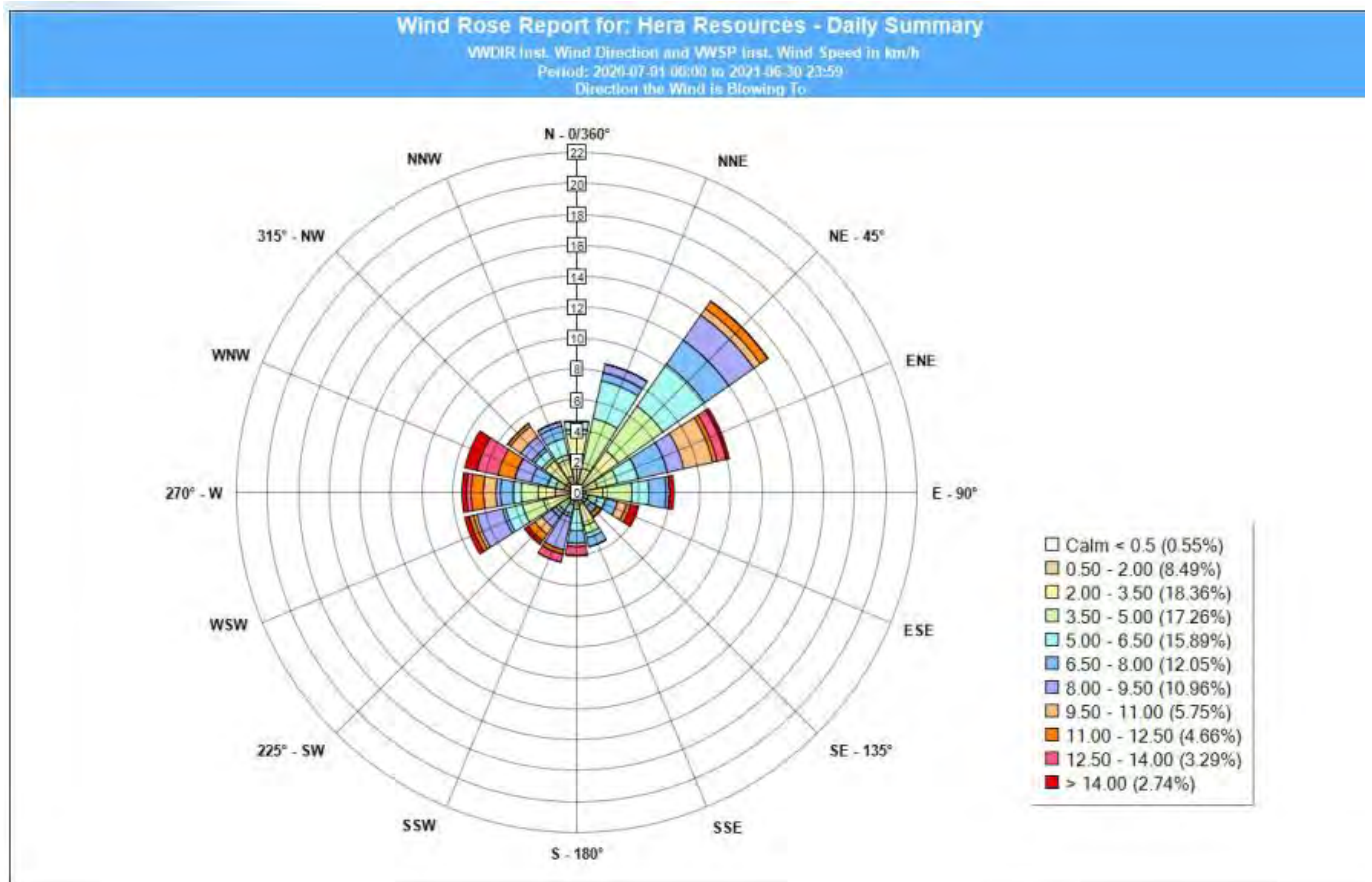



Figure 7 Wind Rose Report for Hera (16 May 2019 to 15 May 2020)

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6.2 Air Quality and Greenhouse Gas

6.2.1 Environmental Management

Management of air quality and greenhouse gas is undertaken in accordance with the *Air Quality and Greenhouse Gas Management Plan*. Hera operates the following air quality monitors:

- DDG1 – Depositional dust gauge monitoring deposited dust at the nearest receptor (R3). Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG2 - Depositional dust gauge monitoring deposited dust at the nearest receptors (R1/R2). Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG3 – Deposition dust gauge monitoring deposited dust on the Nymagee Mining Lease. Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG4 – Deposition dust gauge monitoring deposited dust impacts close to the source. Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG5 – Deposition dust gauge monitoring deposited dust south-west of the mine site (background). Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG6 – Deposition dust gauge monitoring deposited dust north-east of the mine site (background). Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG7 – Deposition dust gauge monitoring deposited dust north of the mine on Tar Road. Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG8 – Deposition dust gauge monitoring deposited dust in the Nymagee village. Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG9 – Deposition dust gauge monitoring deposited dust east of the mine site (background). Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG10 – Deposition dust gauge monitoring deposited dust south-east of the mine site (background). Dust is monitored continuously and reset on a 30 ± 2 day cycle;
- DDG11 – Deposition dust gauge monitoring deposited dust west of Tar Road near DDG2. Dust is monitored continuously and reset on a 30 ± 2 day cycle*;
- BAM Trailer – Beta Attenuation Monitor (BAM) used to monitor particulate matter less than 10 microns in diameter (PM₁₀). Located adjacent to DDG11 and operates in real time* (recently installed);
- Dust Sentry 1 – Sentry monitor is used to monitor particulate matter less than 10 microns in diameter (PM₁₀). Located adjacent to DDG5 and operates in real time* (installation in progress);
- Dust Sentry 2 – Sentry monitor is used to monitor particulate matter less than 10 microns in diameter (PM₁₀). Located adjacent to DDG6 and operates in real time* (installation in progress);
- HVAS – High Volume Air Sampler (HVAS) used to monitor particulate matter less than 10 microns in diameter (PM₁₀) and Total Suspended Particulates (TSP). Located adjacent to the mine camp and operates over a 24-hour period, every sixth day; and
- S1 and S2 – Stack monitoring locations, used to monitor gas emissions from the two gold room furnace stacks (EPL Points 24 and 39). Emissions are monitored annually for nitric oxide concentrations (mg/m³) and in accordance with *Protection of the Environment (Clean Air) Regulation 2010*.

*first data to be presented in 2021-2022 reporting period

The location of air quality monitoring locations and surrounding receptors are shown on **Figure 5**. The criteria for deposited dust, TSP and PM₁₀ are provided in **Table 11**. Standard of concentration Group 6 – *Protection of the Environment Operations (Clean Air) Regulation 2010* limits for the pollutant Nitric Oxide are shown in **Table 12**. Monitoring of greenhouse gas emissions is undertaken in accordance with National Greenhouse and Energy Reporting (NGERs) monitoring and reporting requirements.

Table 11 Air Quality Monitoring Criteria

Pollutant	Averaging Period	^d Criterion
Total Suspended Particulate (TSP) matter	Annual	^a 90 µg/m ³
Particulate matter, 10 µm (PM ₁₀)	24-hour	^a 50 µg/m ³
	Annual	^a 25 µg/m ³
^c Deposited dust	Annual	^b 2 g/m ² /month (maximum increase in deposited dust level)
	Annual	^a 4 g/m ² /month (maximum total deposited dust level)

Notes

a Total impact (i.e. incremental increase in concentrations due to the operation plus background concentrations due to all other sources);

b Incremental impact (i.e. incremental increase in concentrations due to the operation on its own);

c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method; and

d Excludes extraordinary events such as bushfires, prescribed burning, dust storms sea fog, fire incidents or any other activity agreed by the Secretary.

Environmental management activities undertaken during the reporting period in relation to air quality included the following:

- Water trucks are operated on an average of twice per day (much more frequently during the drier periods) on unsealed roads and laydown areas to assist with dust control;
- Molasses has successfully been applied to most surface roads as a dust suppressant. Results have been extremely positive, and this will continue into the future;
- Water sprays are operated continuously throughout the processing plant to ensure that the required level of dust suppression is achieved;
- Vehicles are washed upon returning to the surface from the decline or before leaving site;
- Loaded vehicles are covered before leaving site;
- Disturbance is limited to the minimum area necessary for mining and associated activities;
- Disturbance areas are stabilised as soon as practicable after they are no longer required for mining-related purposes;
- All dust control equipment must be operable at all times with the exception of shutdowns required for maintenance;
- Regularly maintain and service equipment as per the manufacturer’s specification to maximise efficiency;
- Speed limits are restricted to 40 km/hr on all internal access roads to minimise dust generation;
- Progressively review and implement energy efficiency measures throughout the life of the mine;
- Utilising energy efficient equipment and implementing energy saving measures over the life of the mine; and
- Purchase of additional air quality monitors for installation and implementation in the 2021-2022 reporting period.

6.2.2 Environmental Monitoring Results

6.2.2.1 Monitoring During the Reporting Period

Nitric Oxide

Standard of concentration Group 6 – *Protection of the Environment Operations (Clean Air) Regulation 2010* limits and stack monitoring results for the pollutant Nitric Oxide completed by Ektimo Pty Ltd on 1 September 2020 are shown in **Table 12**. Detected values are below limits.

Table 12 Stack Nitric Oxide Monitoring Criteria and Results

Emission Point	Units	Standard of Concentration (Group 6)	Detected values
EPA ID 24 - Gold Room Scrubber Stack	mg/m3	350	4.7
EPA ID 39 - New Gold Room Baghouse Stack	mg/m3		4.6

Depositional Dust Monitoring

Depositional dust monitoring results for the reporting period are shown in **Figure 8**.

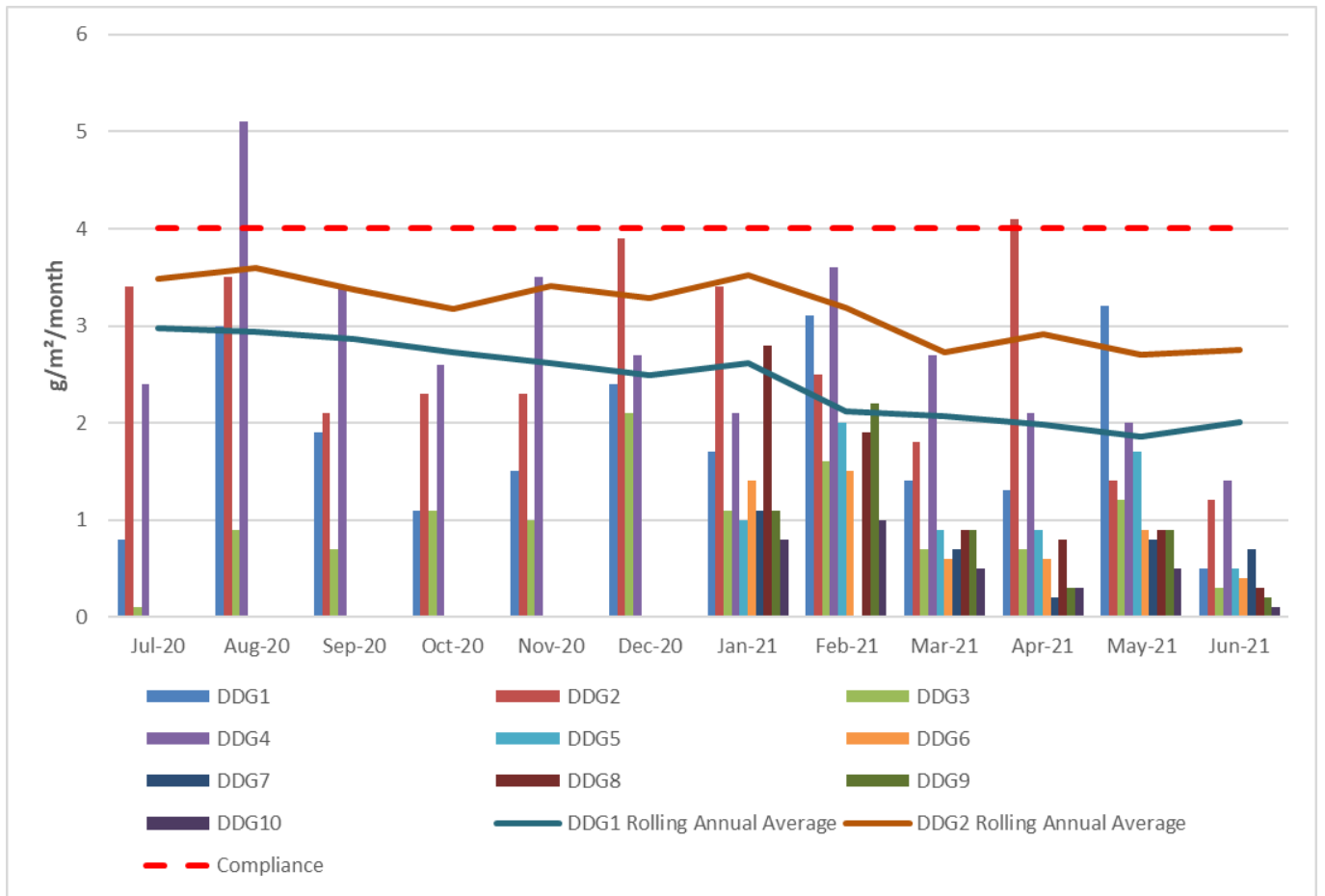


Figure 8 Dust deposition gauge results for the reporting period

Figure 8 shows the 12-month rolling annual average for DDG1 and DDG2 was below the compliance criteria for the entire reporting period. A summary of the depositional dust monitoring results for the reporting period are provided in **Table 13**.

Table 13 2020-2021 Depositional Dust Monitoring Data

Monitor	Minimum (g/m ² /month)	Maximum (g/m ² /month)	Average (g/m ² /month)
DDG1	0.5	3.2	1.8
DDG2	1.2	4.1	2.7
DDG3	0.1	2.1	1.0
DDG4	1.4	5.1	2.8
DDG5	0.5	2.0	1.2
DDG6	0.4	1.5	0.9
DDG7	0.2	1.1	0.7
DDG8	0.3	2.8	1.3
DDG9	0.2	2.2	0.9
DDG10	0.1	1.0	0.5

As shown in **Table 13**, the Annual Review reporting period average depositional dust results were below the 4 g/m²/month PA criteria at both compliance monitors and all investigative monitors.

HVAS Monitoring

A summary of the HVAS monitoring results for the reporting period is included in **Table 14**.

Table 14 2020-2021 HVAS Monitoring Data

Monitor	Minimum (µg/m ³)	Max (µg/m ³)	Average (µg/m ³)
TSP	2.8	102	37.7
PM ₁₀	<0.1	46.9	15.6

PM₁₀ never exceeded the 50 µg/m³ 24hr criteria throughout the reporting period. Additionally, the annual average PM₁₀ result (15.6 µg/m³) was well below the 25 µg/m³ criteria. The 12-month rolling annual average for PM₁₀ remained below the average annual limit throughout the entire reporting period.

The annual average TSP result (37.7 µg/m³) was within the 90µg/m³ criteria. The 12-month rolling annual average for TSP was below the criteria for the entire reporting period. There is no 24hr criteria for TSP.

The 24hr PM₁₀ results for the reporting period, as well as the EA prediction (for receptor R6), the 24hr PM₁₀ limit (PA 10_0191 Schedule 3, Condition 12), rolling annual averages for PM₁₀ and TSP are presented in **Figure 9**.

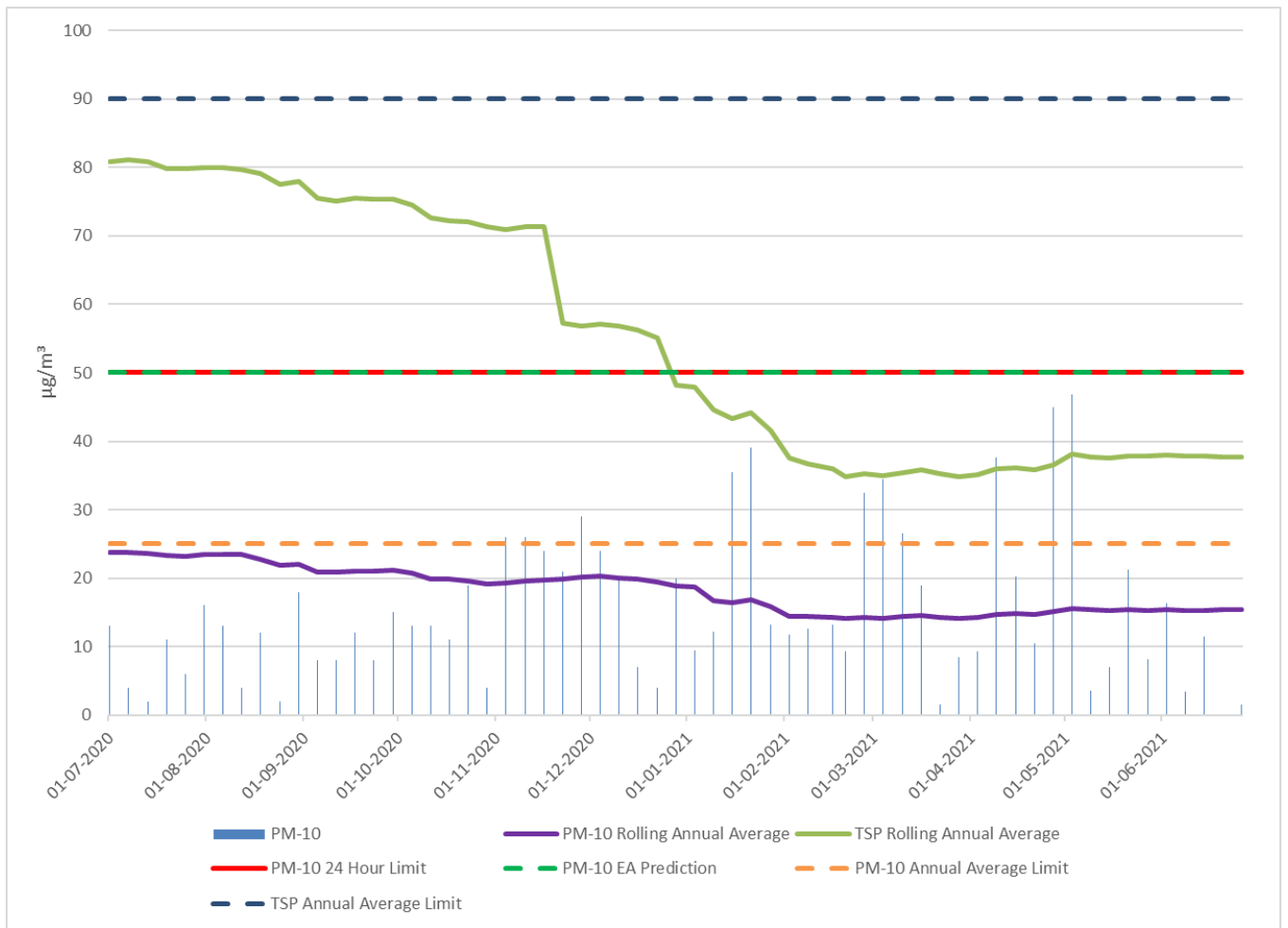


Figure 9 HVAS 24hr PM10 Results for the Reporting Period

6.2.2.2 Long Term Monitoring

Depositional Dust Monitoring

Figure 10 presents the annual average depositional dust results from the 2014-2015 to the 2020-2021 Annual Review period. The EA predictions for the Mine have also been included in this figure, with the prediction for DDG1 corresponding to R6 and the prediction for DDG2 corresponding to R1 / R2.

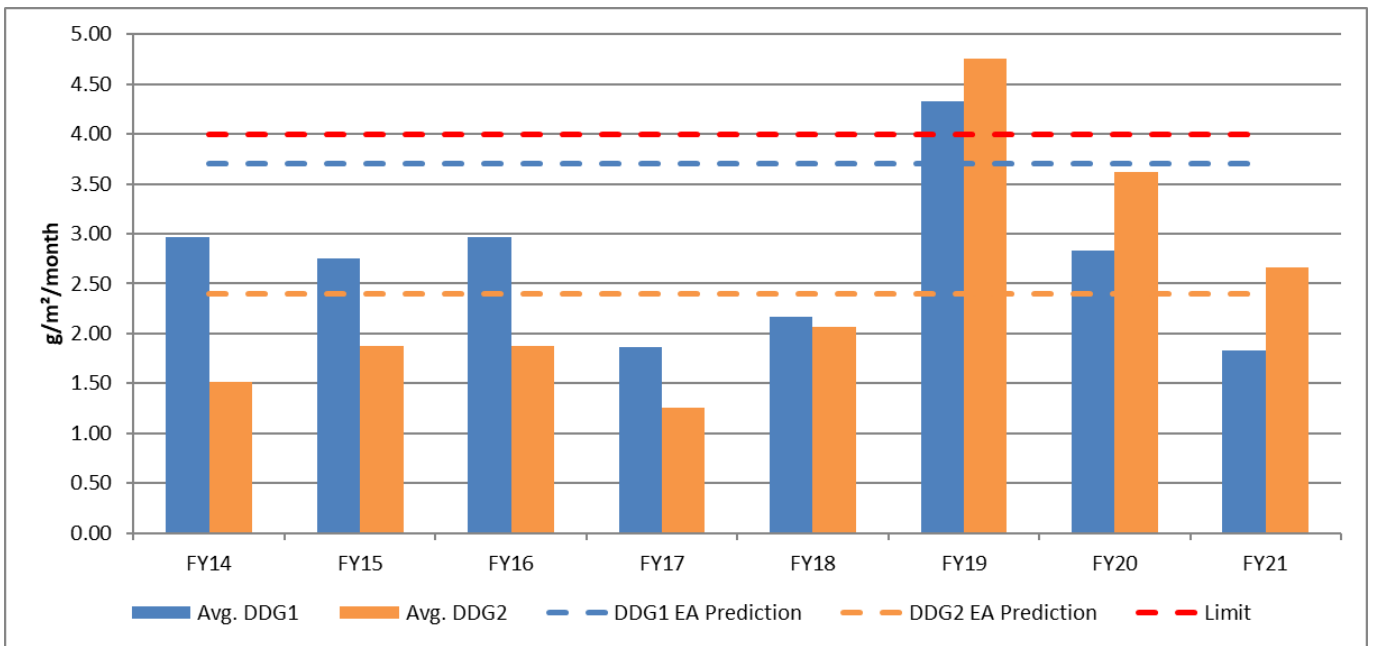


Figure 10 Average Dust Deposition Results 2014 to 2021

As shown in **Figure 10**, depositional dust results have generally been within the Project Approval limit, with the exception of the 2018-2019 reporting period for both DDG1 and DDG2. DDG2 has been above the level predicted in the Environmental Assessment (EA) during the last two reporting periods (2019-2020 and 2020-2021). This is likely attributed to the prolonged drought conditions being experienced in far western NSW (refer **Section 6.1**).

HVAS Monitoring

Figure 11 presents the TSP annual averages from 2014-2015 to 2020-2021, as well as the EA annual average TSP prediction (for receptor R6) and PA annual average TSP criteria (PA 10_0191 Schedule 3, Condition 12).

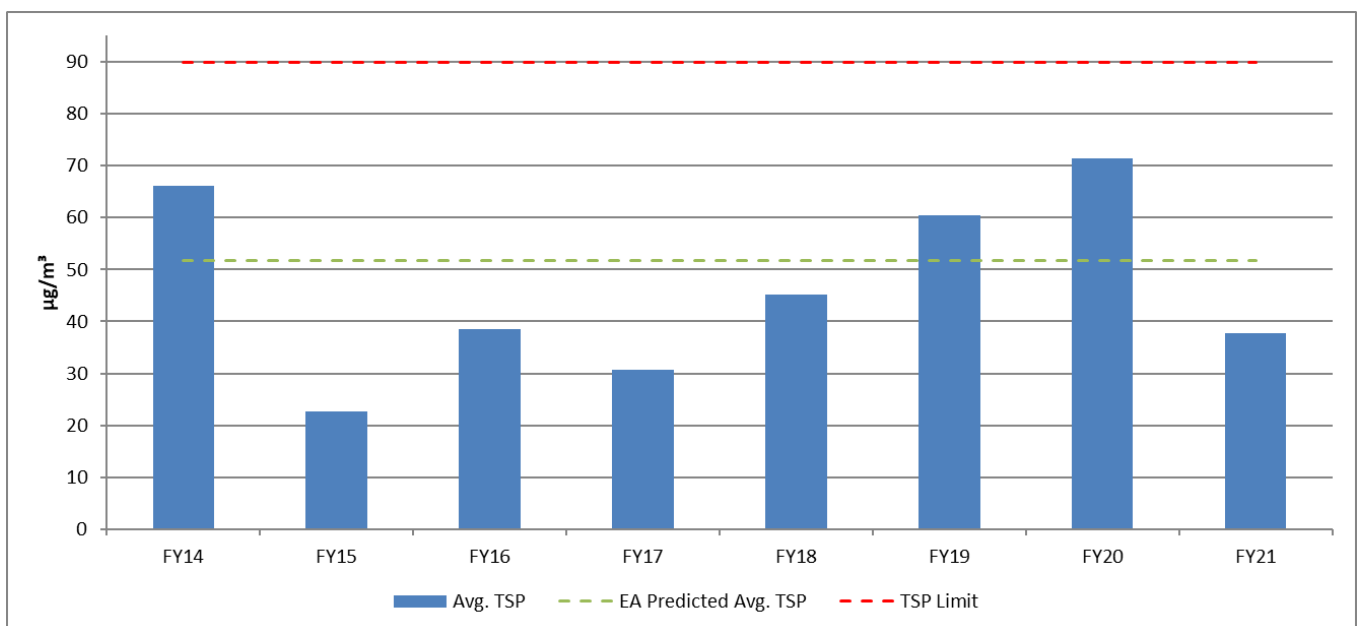


Figure 11 TSP Long Term Annual Averages

As shown in **Figure 11**, TSP results had been generally increasing since the 2014-2015 reporting period and exceeded the EA prediction in both the 2018-2019 and 2019-2020 reporting periods. The TSP result for 2020-2021

reduced to a level not seen since prior to 2017-2018. All results have been below the annual average PA TSP criteria. The elevated results were likely due to background climatic conditions caused by the prolonged drought, as surface operations at Hera have remained generally unchanged over this period.

Figure 12 presents the PM₁₀ annual averages from 2014-2015 to 2020-2021, as well as the EA annual average PM₁₀ prediction (for receptor R6) and PA annual average PM₁₀ criteria (PA 10_0191 Schedule 3, Condition 12).

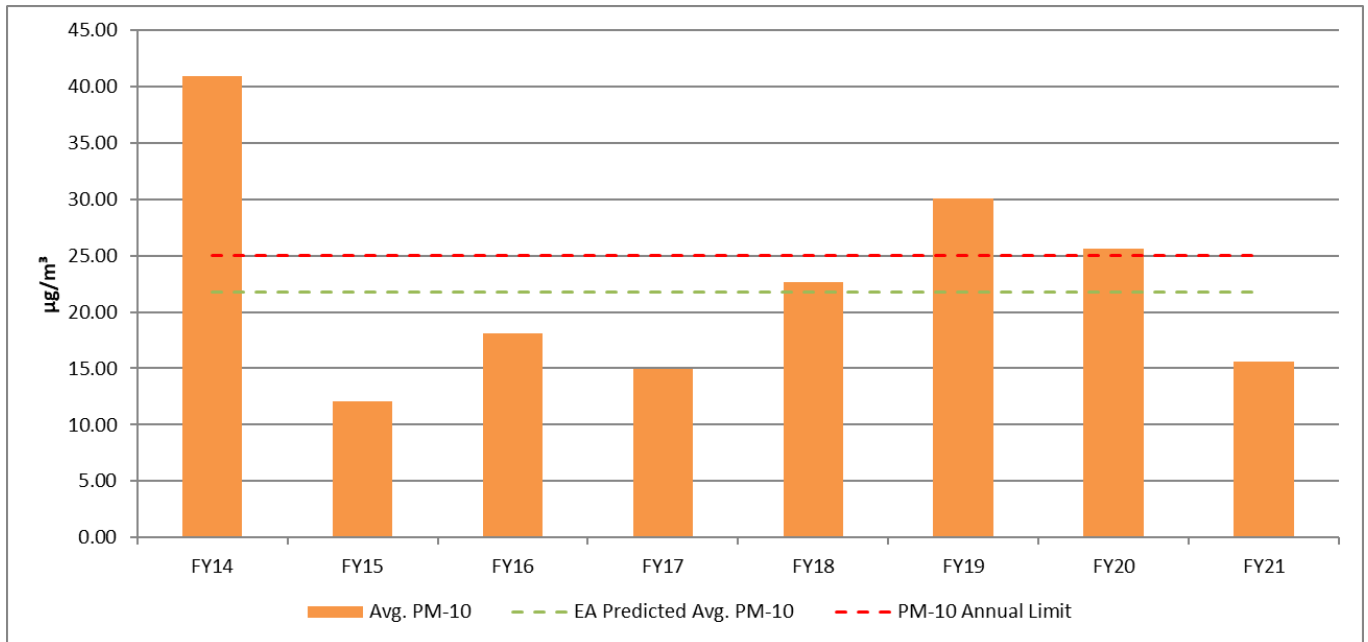


Figure 12 PM₁₀ Long Term Annual Averages

As shown in **Figure 12**, PM₁₀ results had been generally increasing since the 2014-2015 reporting period and exceeded the EA prediction in 2017-2018, 2018-2019 and 2019-2020. The PM₁₀ result for 2020-2021 was the lowest recorded since 2016-2017. However, all results have been below the annual average PA PM₁₀ criteria, with the exception of the 2018-2019 and 2019-2020 reporting period.

Greenhouse Gas Emissions

A summary of greenhouse gas emission data against the EA predictions has been presented in **Table 15**. As the FY21 NGERs reporting has not yet been completed, the FY20 data has been included.

Table 15 2019-2020 NGERs Data

Data	Scope 1 ^a (t CO ₂ -e)	Scope 2 ^b (t C)2-e)	Total (Scope 1 and 2)
EA Predictions	19,158	0	19,158
FY20 Data	22,706	21	22,727

a. Scope 1 emissions are the emissions released to the atmosphere from activities on site, e.g. fuel consumption (gas, diesel, etc.).

b. Scope 2 emissions are the emissions released from the indirect consumption of energy e.g. electricity purchased from the grid.

As shown in **Table 15**, the 2019-2020 data was 18.63% higher than the predictions made in the EA. The original EA assumed Hera Resources would process approximately 350,000t of ore. In FY20, 410,495 t of ore were processed or 17.28% more ore than the predictions used in the EA. This indicates that Hera’s greenhouse gas emissions are in accordance with predictions.

6.2.3 Performance Issues and Proposed Improvements

During the reporting period there were no exceedances of the PA 10_0191 24-hour criteria at the HVAS (PM₁₀). On 1 September 2020, the EPA ID 24 – Gold Room Scrubber Stack recorded a Mercury result of 0.26 mg/m³ which was

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confirmed with the issue of the Ektimo Pty Ltd report on 5 November 2020 for Company review. This scrubber stack is analysed yearly as per EPL 20179 Condition M2.2. PA 10_0191 Condition 13, Schedule 3 dictates that the Company shall ensure that all point-source discharge locations on the site are designed and operated to comply with the maximum discharge concentrations applicable under the *Protection of the Environment (Clean Air) Regulation 2010* and the requirements of any Environmental Protection Licence issued for the project under the POEO Act. The Gold Room Scrubber Stack falls under Part 5: Air impurities emitted from activities and plant, Division 4 Group 6 treatment plants. Mercury has a Group 6 standard concentration limit of 0.2 mg/m³. No impacts on neighbouring properties were observed. After receiving feedback from the scrubber manufacturer Hera has implemented a preventative maintenance plan on the unit as the exceedance has a direct link to the volumetric flow rate reducing over time. The company is consulting with Ektimo to undertake another emissions test in early 2021 to confirm the successful implementation of the preventative maintenance schedule. The company is also investigating upgrading the scrubber stack to a more efficient and user-friendly unit.

Hera has continued to use molasses as dust suppression on access roads, and water sprays on ore transfer points within the crushing circuit. In response to the 2019 Independent Environmental Audit, Hera investigated the placement of additional Dust Deposition Gauges outside the mine site boundaries with the assistance of an air quality consultant, seven additional Dust Deposition Gauges, a BAM trailer and two Dust Sentries have been purchased for installation and implementation during the 2021-2022 reporting period as recommended by the air quality consultant. The information collected by this dust monitoring network will allow Hera Resources to determine if exceedances have been caused by background conditions or operations and respond accordingly.

6.3 Erosion and Sediment

6.3.1 Environmental Management

Erosion and sediment control for the reporting period was undertaken in accordance with the *Hera Mine Water Management Plan*. Management measures implemented during the reporting period included the following:

- Dig permits are required before any ground is broken;
- Disturbance areas are stabilised following disturbance;
- Stockpiles are shaped to reduce batter slope and length;
- Inspections of all site water storages and drainage lines are conducted once per quarter or after heavy rainfall events (> 25 mm in 24-hours); and
- All contaminated and dirty water storages are desilted as required.

6.3.2 Environmental Monitoring Results

Inspections of all mine water storages and drainage lines occurs after receiving > 25 mm in 24-hours. No further action was required after inspections were undertaken.

6.3.3 Performance Issues and Proposed Improvements

There were no erosion and sediment incidents during the reporting period. No changes to erosion and sediment control at Hera are proposed for the following reporting period.

6.4 Contaminated Polluted Land and Hazardous Materials

6.4.1 Environmental Management

Contaminated and/or polluted land at Hera is managed in accordance with the *Hazardous Materials Management Plan*. Management measures implemented during the reporting period included the following:

- Hazardous, non-combustible and contaminated waste material is temporarily stored in the Workshop Waste Management Area, in sealed steel or plastic drums and shipped off-site for appropriate disposal or recycling;

- Any hazardous materials are stored and handled in accordance with the relevant guidelines. Storage facilities are clearly labelled, and are regularly inspected and maintained;
- Hydrocarbon storages are bunded, any runoff from wash bays is captured and treated, and storages are regularly inspected;
- Any chemicals that are spontaneously combustible are stored tightly in containers in cool, dry, well ventilated areas, removed from oxidising agents, acids, direct sunlight, heat or ignition sources;
- SDS are located with any substance posing a risk to people and/or the environment;
- All relevant personnel are trained in the handling of hazardous materials and the use of appropriate personal protective equipment (PPE);
- Appropriate PPE, spill kits and SDS' are made available to personnel responsible for the transportation, handling, storage, use and disposal of hazardous materials;
- Transportation of hazardous materials is undertaken by contractors who are certified and licenced to carry dangerous goods;
- Incidents leading to the potential contamination of land onsite are reported under Hera Resources' incident reporting framework. All incidents are investigated to determine the root cause and facilitate process improvements;
- Pollution incidents of land causing actual or potential material harm to the environment are reported to the relevant external regulators; and
- Establishment of a bioremediation bay in the TSF containment in consultation with the EPA and DPIE.

6.4.2 Environmental Monitoring Results

No monitoring was required during the reporting period.

6.4.3 Performance Issues and Proposed Improvements

No hazardous materials incidents were reported in the reporting period. No changes to contaminated and/or polluted land management at Hera are proposed for the following reporting period.

6.5 Threatened Flora and Fauna

6.5.1 Environmental Management

Threatened flora and fauna at the Mine are managed in accordance with the *Biodiversity Management Plan*. Management measures undertaken included:

- Pre-clearance surveys are undertaken prior to any vegetation clearing;
- Vegetation clearing is undertaken in accordance with the protocols outlined in the Biodiversity Management Plan;
- Enhancement of fauna habitat at suitable locations on the Mine Site;
- Completion of routine monitoring;
- Feral goat management;
- Bushfire management; and
- Hera has progressed with updates to the Biodiversity Management Plan including a Biodiversity Stewardship Agreement (BSA) (previously known as Biodiversity Offset Strategies) for the Chelsea Property. The Biodiversity Management Plan was approved in December 2020. The BSA was submitted to the Biodiversity Conservation Trust (BCT) for determination during the reporting period. Hera Resources is anticipating this will be determined in the next reporting period.

Biodiversity monitoring is undertaken annually across 13 locations within the Project Approval area, and at seven locations at the Chelsea Property. The ecological monitoring locations within the Project Approval area are shown on **Figure 5**.

6.5.2 Environmental Monitoring Results


A biodiversity monitoring survey was undertaken by Area Environmental Consultants & Communication (2020) in October 2020. The results are summarised below:

- Assessment of 13 monitoring points at the site identified 134 flora species, of which 114 are native species and 20 are exotic species;
- Assessment of six of the seven monitoring points at the Chelsea Property identified 104 flora species, of which 87 were native species and 17 were exotic species;
- Average number of species per plot for native and exotic species rose significantly from the 2019-2020 results. The average number of native species was notably more than any other monitoring year. The flush of weed growth after autumn and winter rain caused the percentage native richness to be the second lowest of all monitoring events and respectively, the percent exotic richness was the second highest of all monitoring events;
- Tree species have remained stable since the 2019-2020 survey, however due to the increased rainfall over the last year the shrub species count has increased in three of six Chelsea monitoring points. This however, at least partially, reflects the change in biodiversity assessment method in 2020-2021. Throughout Chelsea the groundcover richness has doubled across all six monitoring plots since 2019-2020;
- Fauna observations were stable at Chelsea, however a decrease in most fauna classes from the 2019-2020 results was seen at the Hera project site. As the food resources increased through 2020, it is possible fauna observations will increase at both Chelsea and the Hera project site by 2021-2022. 2016 was also a wet year and, as per 2020-2021, delivered low fauna observations. This was followed in 2017 by a noticeable increase in fauna. The trend is likely linked to rainfall as the increase in rainfall allows for greater resources throughout the Hera and Chelsea habitats in turn increasing breeding conditions; and
- Overall the Nymagee area can experience harsh climatic extremes. The results demonstrate the environment's capacity to respond with rain after several years of well below average rainfall.

6.5.3 Performance Issues and Proposed Improvements

There were no flora or fauna related incidents during the reporting period. A number of recommendations were made from the 2019 biodiversity monitoring survey. These recommendations will be implemented once the BSA is approved (dependent on the easing of the ongoing drought conditions):

- Continue feral animal control monitoring (Goats, pigs, foxes, cats and rabbits);
- Undertake / maintain feral animal control (Goats, pigs, foxes);
- Undertake White Cypress Pine thinning;
- Include additional fauna / flora monitoring points in areas where White Cypress Pine thinning takes place (mechanically or by fire);
- Include additional fauna / flora monitoring points / Landscape Function Analysis points in areas being rehabilitated;
- From 2019 onwards, alter vegetation plot monitoring methods to align with the Biodiversity Assessment Method 2017 which is the current NSW Government process for assessing biodiversity in an objective and repeatable way;
- Maintain set fauna monitoring sites and fauna search areas around free-standing water bodies and Tailing Storage Facility – targeting amphibian / waterbird points;
- Small standard mammal sampling should be continued at the Chelsea BOA annually;
- Establish reptile search areas;
- Continue the established photo monitoring protocol;
- Re-introduce Landscape Function Analysis once management actions are in place; and
- Standardise annual monitoring that will include Hera, Old Nymagee and Chelsea.

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6.6 Weed and Pest Management

6.6.1 Environmental Management

Weed and pest management at the Mine is undertaken in accordance with the *Biodiversity Management Plan*. Management measures undertaken included:

- Feral animal management undertaken as required, including goat removal, cat trapping, fox baiting, and rabbit baiting and/or warren ripping;
- Vehicles are washed down on a regular basis to prevent weed spread; and
- Weed spraying is conducted as required with a primary focus on industrial areas. Weeds targeted during the reporting period included Scotch Thistle, Variegated Thistle and Tobacco Bush.

6.6.2 Environmental Monitoring Results

The 2020 biodiversity monitoring survey (refer **Section 6.5**) also identified weed and pest species at Hera and Chelsea Property. The monitoring results identified four feral animal species at the Hera Mine:

- Goat (*Capra hircus*);
- Pig (*Sus scrofa*);
- Rabbit (*Oryctolagus cuniculus*); and
- Fox (*Vulpes vulpes*).

The same four feral animal species were recorded in the previous year's monitoring survey.

The 2020 biodiversity monitoring results recorded twenty exotic species at the Hera Mine and seventeen species at the Chelsea property. The 2019 results were lower, with only seven exotic species being recorded at Hera and only three exotic species being recorded at the Chelsea property. This indicated the weed burden increased at Hera, likely in response to the increased rainfall.

6.6.3 Performance Issues and Proposed Improvements

There were no weed or pest related incidents during the reporting period. Continued targeted mustering of goats will continue in the next reporting period.

6.7 Blasting

6.7.1 Environmental Management

Blast activities at the Mine are managed in accordance with the *Blast Management Plan*. Management measures undertaken included:

- Surface blasting will be undertaken only between the hours of 9:00am to 5:00pm, Monday to Saturday except for emergency or safety-related reasons. No surface blasting was undertaken during the period;
- Above ground blasting operations will not exceed three blasts per day, unless an additional blast is required following a blast misfire, with no more than five blasts per week, averaged over a calendar year;
- Appropriate signage and notification of blasts will be provided to the public;
- All blasts will be designed by a suitably qualified and experienced person/s to achieve compliance with criteria and to minimise the potential for fly-rock;
- Surface blasting will be avoided in strong wind conditions;
- The time between drilling and loading will be minimised to reduce blast hole deterioration; and
- Moisture content will be minimized within blast holes to reduce potential fumes.

Blast vibration and overpressure are recorded for all blasts. The blast vibration and overpressure criteria from PA10_0191 and EPL 20179 are provided in **Table 16**.

It is anticipated that surface blasting will be required as part of developing the Surface Extraction Area. This will be undertaken in accordance with management plans, relevant legislation and consents.

Table 16 Blast Criteria

Location	Time Period	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance
Residence on privately-owned land	Any time	120	10	0%
	Day ¹	115	5	5% of total blasts over a period of 12 months
	Evening ²	-	2	5% of total blasts over a period of 12 months
	Night ³ and all day on Sundays and public holidays	-	1	0%

1. Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.

2. Evening is defined as the period from 6pm to 10pm.

3. Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

6.7.2 Environmental Monitoring Results

6.7.2.1 Monitoring During the Reporting Period

623 blasts were initiated during the reporting period. Two blasts exceeded the vibration criteria. On 3 April 2021 at 19:00:52 in the evening, one blast was recorded with a vibration of 2.27 mm/s at the Harris Residence. 5% of total blasts over a period of 12 months are permitted to exceed the 2 mm/s ground vibration criteria in the evening. On 21 April 2021 at 06:44:54 in the morning, one blast was recorded with a vibration of 1.14 mm/s at the Harris Residence. This was not recorded as an exceedance as Hera Resources has an agreement in place with the landholder. The agreement has been shared with the EPA and DPIE. The recorded vibration at the Nymagee Township for the same blast was 0.14 mm/s. Further details are discussed in Section 6.7.3. All blasts were within PA 10_0191 (Schedule 3, Condition 4) and EPL 20179 (Condition L5.1) limits. A summary of results is provided in **Table 17**.

Table 17 Blast Monitoring Results Summary

Parameter	Min	Max	Non-Permitted Exceedances
Blast Vibration	0.05 mm/s	2.27 mm/s	0
Blast Overpressure	73.1 db	106.5 db	0

The blast overpressure and vibration results for the reporting period, against the applicable criteria, are presented in **Figure 13**, **Figure 14**, **Figure 15** and **Figure 16**.

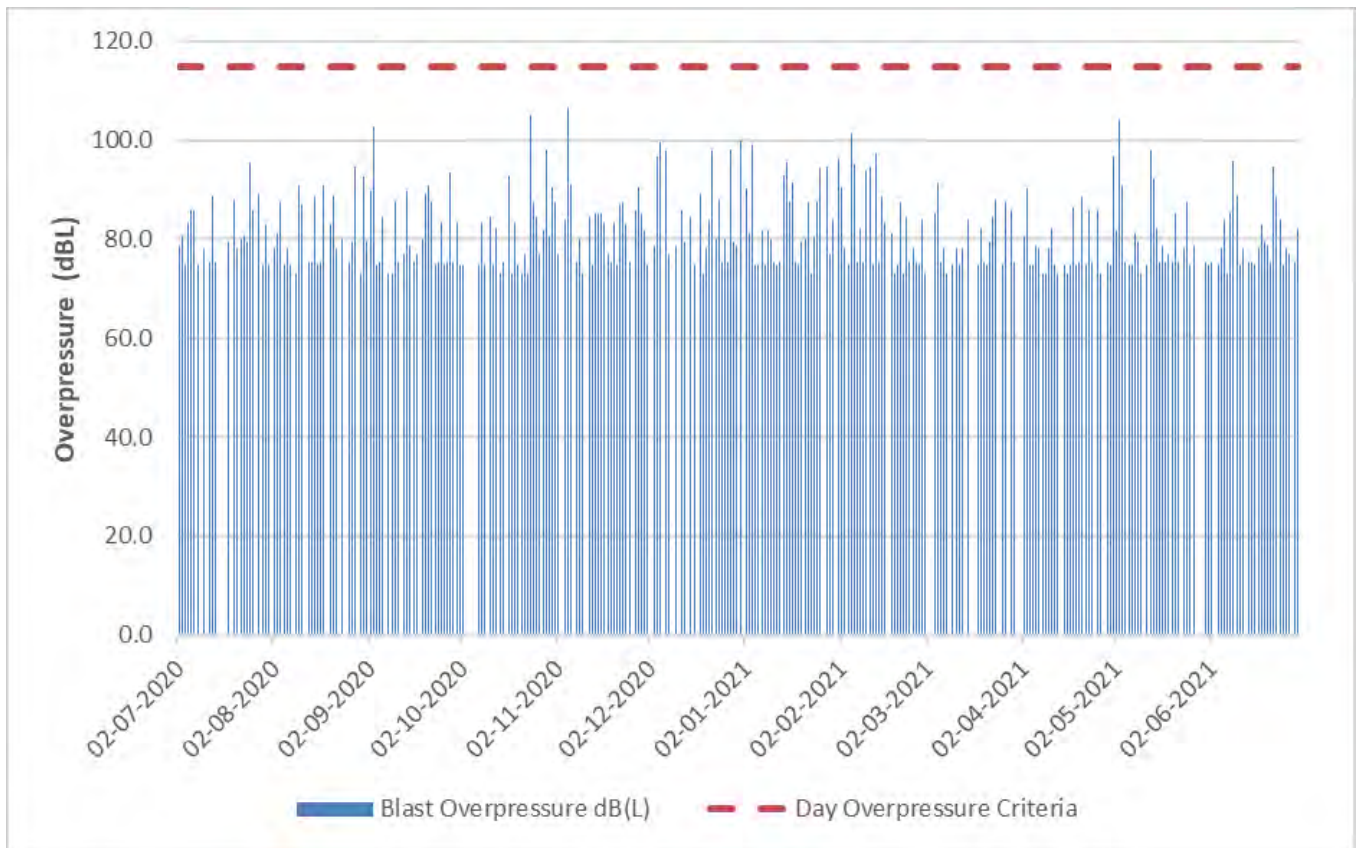


Figure 13 2020-21 Blast Overpressure Monitoring Results

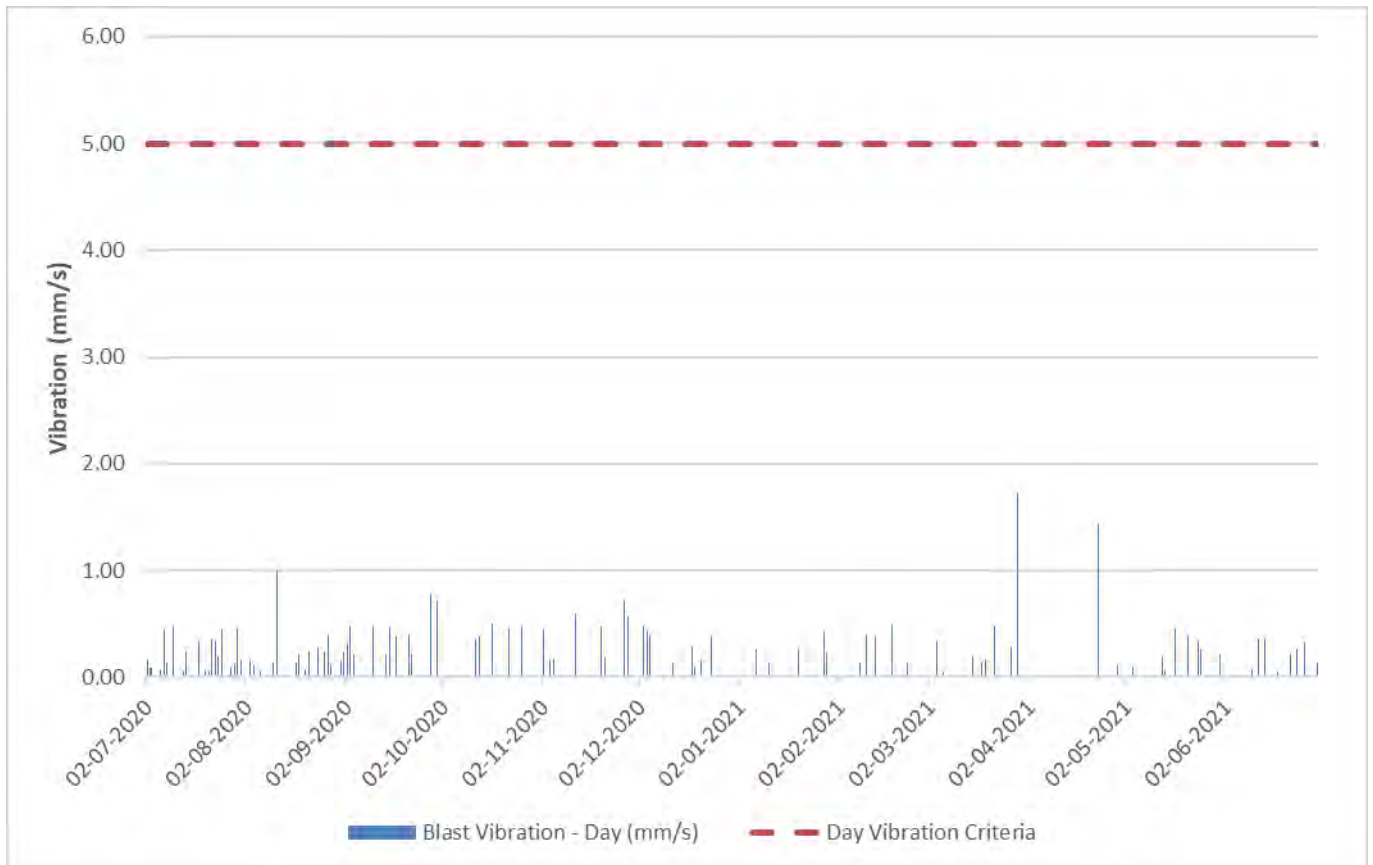


Figure 14 2020-21 Blast Vibration Monitoring Results (Day)

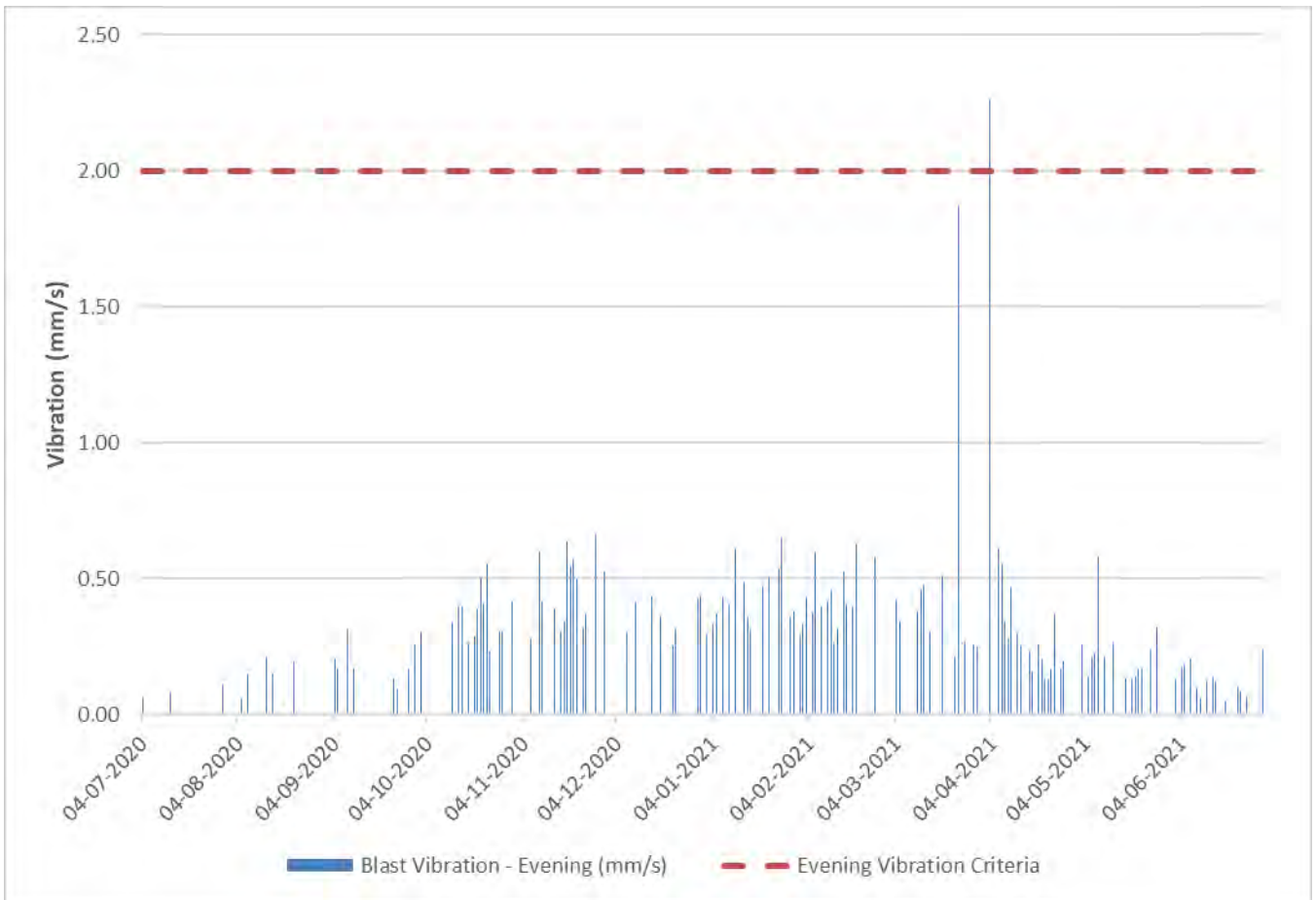


Figure 15 2020-21 Blast Vibration Monitoring Results (Evening)

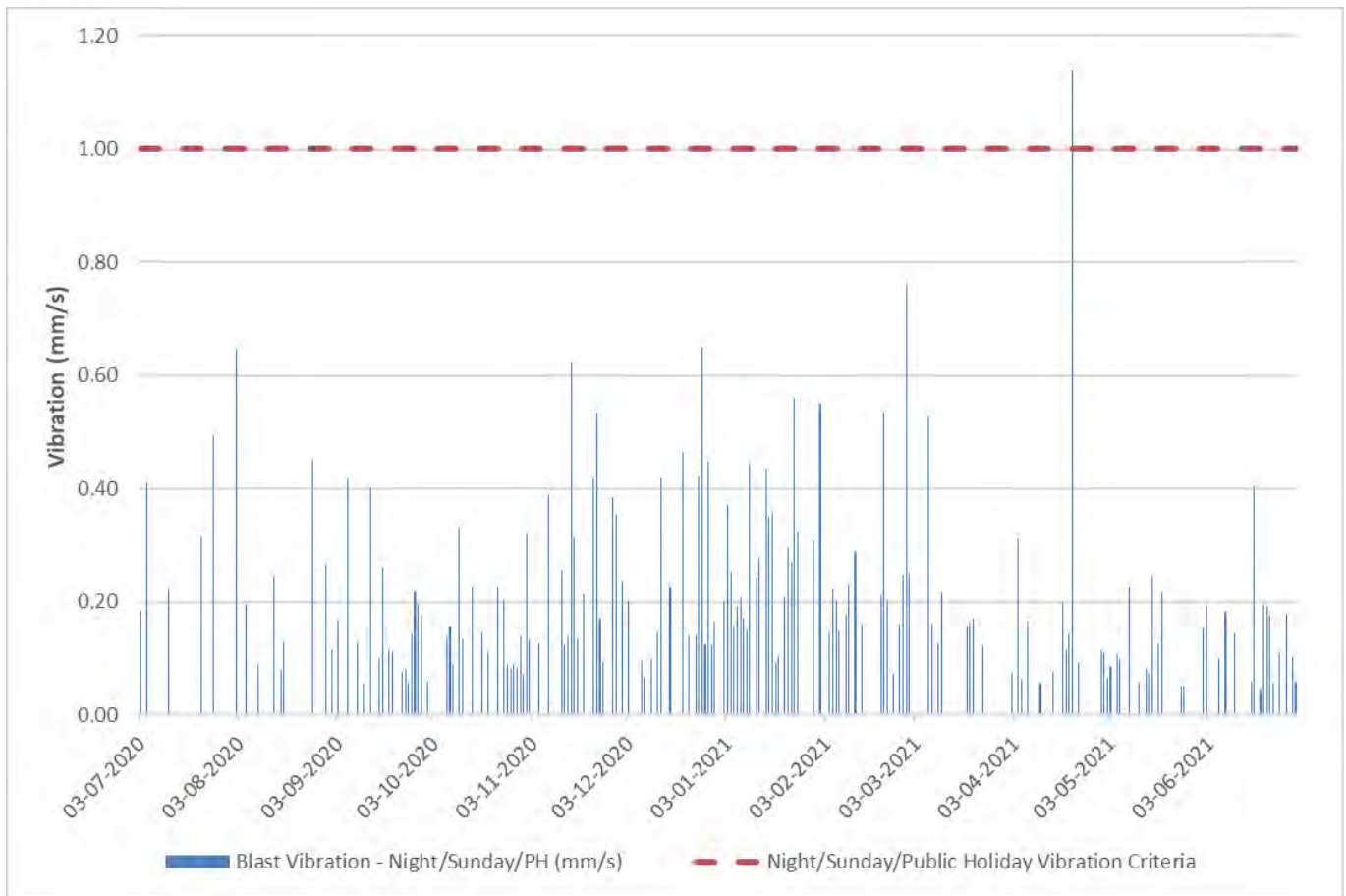


Figure 16 2020-21 Blast Vibration Monitoring Results (Night/Sunday/PH)

6.7.2.2 Long Term Monitoring

Figure 17 presents a summary of the average annual blast vibration for the life of the mine (i.e. since 2013). The increasing trend evident from 2013-2014 to 2015-2016 was a result of the project transitioning from an underground development focus to an underground production focus (i.e. production blasting typically has greater maximum instantaneous charges than development blasting). The blast vibration reduced from 2015-2016 to 2017-2018, which was likely a result of the relocation of the blast monitor to the nearest residence on privately owned land. Results increased again during the 2018-2019 reporting period and held steady during the 2019-2020 reporting period before reducing to the lowest levels seen since 2013-2014 in this reporting period.

The blasting assessment undertaken as part of the EA (Spectrum Acoustics, 2011) predicted that for receptor R3 (nearest receptor to the box cut) the peak vibration would be 0.1 mm/s. Only 13.85% of blast vibration results were below this prediction during the 2020-2021 reporting period. Additionally, Spectrum Acoustics (2011) predicted that for receptor R3 that the peak blast overpressure would be 105 dB. All blast overpressure results during the reporting period, except for two, were below this prediction.

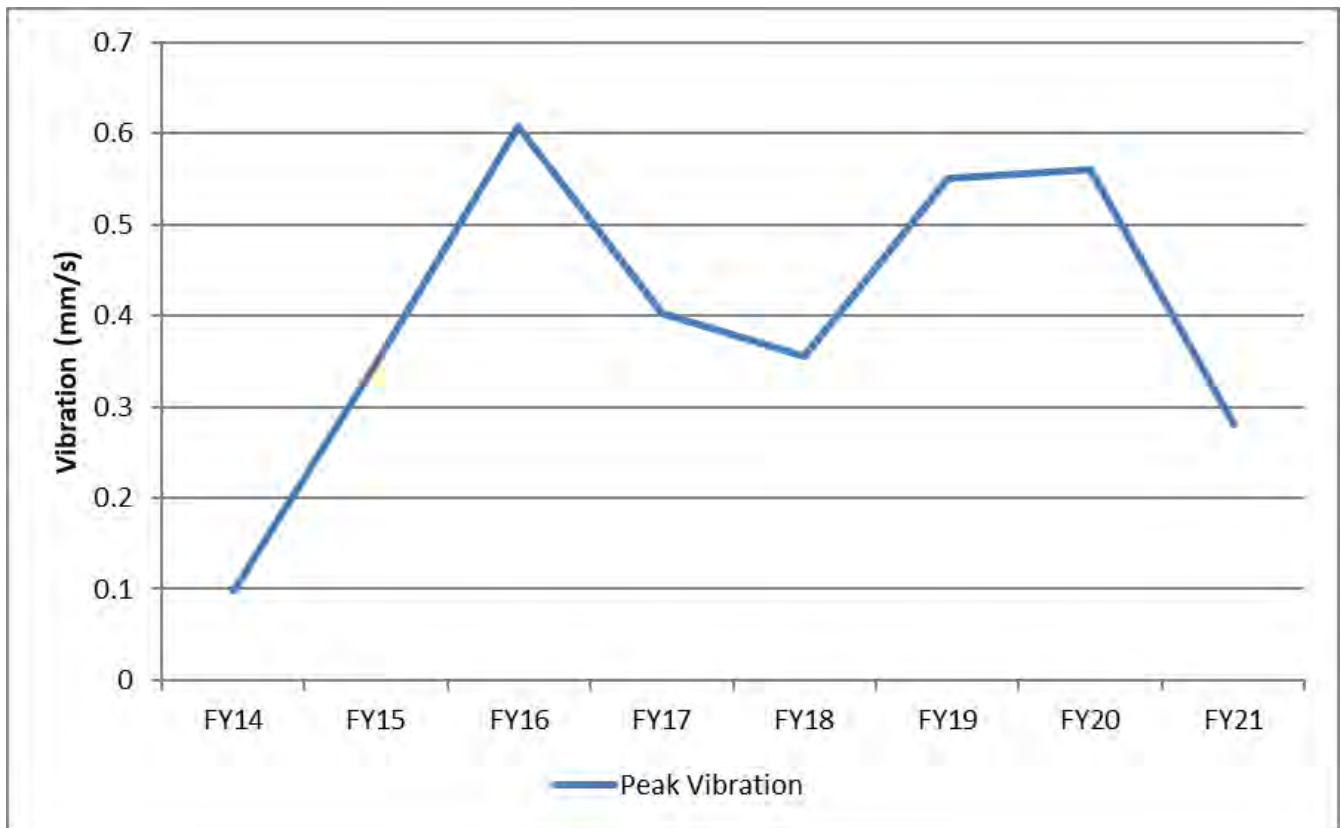


Figure 17 Summary of the Average Blast Vibration for the Life of the Hera Mine

6.7.3 Performance Issues and Proposed Improvements

No performance issues were identified during the reporting period.

No changes to blast management at Hera are proposed for the following reporting period.

6.8 Operational Noise

6.8.1 Environmental Management

Operational noise at Hera is managed in accordance with the *Noise Management Plan*. Operational noise management activities during the reporting period included:

- Compliance with the approved hours of operation;
- Minimising the noise impacts of the operation during meteorological conditions when the PA 10_0191 noise limits do not apply;
- Regularly servicing all equipment on site to ensure sound power levels of each item remains at or below the default / or factory-set values;
- Reducing operational noise where possible by applying strategies such as:
 - Utilising natural and artificial noise barriers (e.g. hay bales around exploration drill rigs);
 - Operation of individual plant/equipment;
 - Planning 'noisy' operations for suitable periods of the day;
 - Fitting plant/equipment with noise abatement devices where possible; and
 - Sourcing low frequency alarms.
- Ensuring that all blasts are designed by a suitably qualified and experienced blasting engineer or shot-firer and that each is designed to achieve the relevant noise criteria at the closest residence; and
- Maintaining an open dialogue with the surrounding community and neighbours to ensure any noise or vibrations concerns are addressed.

Noise monitoring is conducted at R1/R2, R3 and R4 (refer **Figure 5**). Hera Resources have an active Noise Agreement in place with the resident at R3 and therefore, noise limits do not apply. The agreement has been shared with the EPA and DPIE. The PA 10_0191 and EPL 20179 criteria are presented in **Table 18**.

Table 18 Noise Criteria

Location	Day	Evening	Night	
	(LAeq(15-minute))	(LAeq(15-minute))	(LAeq(15-minute))	(LA1(1 minute))
All residential receivers	35 dB	35 dB	35 dB	45 dB

6.8.2 Environmental Monitoring Results

Attended noise monitoring was conducted by Muller Acoustic Consulting Pty Ltd (MAC) in May 2021 at receptors R1/R2, R3 and R4. **Table 19** includes the monitoring data, as well as the EA predictions, and the PA 10_0191 and EPL 20179 criteria. Mining noise was inaudible during the monitoring in the 2020-2021 reporting period.

Table 19 Summary of attended noise monitoring results conducted by MAC on 11 and 12 May 2021

Receiver	Date	Time	LAeq Limit	LA Max Limit (dB)	LAeq Site Contribution (dB)	LA Max Site Contribution (dB)	LAeq EA Prediction (dB)	LA Max EA Prediction (dB)
R1-R2 (NM1)	12/05/2021	09:24	35	n/a	Inaudible	n/a	<20	30
R3 (NM2)	12/05/2021	09:46	35	n/a	Inaudible	n/a	26	40
R4 (NM3)	12/05/2021	10:06	35	n/a	Inaudible	n/a	<20	35
R1-R2 (NM1)	11/05/2021	18:56	35	n/a	Inaudible	n/a	<20	30
R3 (NM2)	11/05/2021	19:44	35	n/a	Inaudible	n/a	26	40
R4 (NM3)	11/05/2021	19:22	35	n/a	Inaudible	n/a	<20	35
R1-R2 (NM1)	11/05/2021	22:00	35	45	Inaudible	Inaudible	<20	30
R3 (NM2)	1/05/2021	22:24	35	45	Inaudible	Inaudible	26	40
R4 (NM3)	11/05/2021	22:49	35	45	Inaudible	Inaudible	<20	35

The results in the previous three reporting periods were all below the noise criteria.

6.8.3 Performance Issues and Proposed Improvements

There were no noise related incidents during the reporting period. No changes to the management of noise are proposed.

6.9 Traffic Management

6.9.1 Environmental Management

Traffic management at Hera is managed in accordance with the *Traffic Management Plan*, which is currently being updated to incorporate MOD 6 changes. Traffic management measures that are implemented at the site include:

- Heavy vehicles transporting concentrate use the main route when conditions allow, and the alternate route when required (e.g. during times of road closures following heavy rain or when more than eight truck movements per day averaged over a calendar month are required);
- Implementation of a Driver’s Code of Conduct;
- All plant and equipment used to transport materials from the site are maintained in a proper and efficient condition, and operated in a safe manner;
- Vegetation is managed so that sight distances on the road shoulder are maintained;
- A speed limit of 40 km/hr applies to the Main Site Access Road, Light Vehicle Access Road and roads around the leases, and a speed limit of 30 km/hr applies to all areas within the mine site; and
- All vehicles travelling on public roads are required to abide by the local speed limits ensuring they slow down to 50 km/hr while travelling through the Nymagee, Cobar and Hermidale townships.

The PA 10_0191 limits for transport of concentrate are:

- Transport of no more than 60,000 t of lead/zinc concentrate per calendar year;_Transportation of lead and zinc concentrate and gold doré from the site – daylight hours, 7 days per week;_and
- No more than eight vehicle movements (entering and leaving the site) per day, averaged over a calendar month.

Note: Ore and Waste Rock Transport between Hera and Peak Gold Mine is monitored when it is occurring (as per the conditions of MOD6). Data will begin to be reported in this AEMR in the next reporting period if transport takes place.


6.9.2 Environmental Monitoring Results

In accordance with PA 10_0191, Schedule 3, Condition 37, Hera Resources is required to maintain records of all concentrate trucks arriving and departing from the site including the date, time, amount of concentrate transported and average number of vehicle movements per day. A summary of these records is provided in **Table 20** below. The records in **Table 20** align with calendar year as per requirements of PA 10_0191.

Table 20 Monthly Volumes of Concentrate Transported

Month	Tonnes of Concentrate Transported	Average Vehicle Movements Per Day
January 2020	4,822.73	6.39
February 2020	4,574.97	6.39
March 2020	2,872.29	3.81
April 2020	1,658.88	2.27
May 2020	3,264.13	4.32
June 2020	3,189.33	4.40
July 2020	4,648.76	3.06
August 2020	3,231.17	2.16
September 2020	4,042.12	2.68
October 2020	4,974.52	3.29
November 2020	4,938.54	3.4
December 2020	3,740.63	2.48
Total	45,958.07	-

The transport of concentrate in the 2020 calendar year reporting period (45,958.07 t) was within the PA 10_0191 approved calendar year limit of 60,000tpa and the number of vehicle movements was less than eight per day (monthly average). Additionally, all truck movements during the reporting period were within the approved transport hours.

	Hera Annual Review 2020-2021	
	Author	B Topp (SLR) and J.Thompson (Hera)
	Reporting period	1 July 2020 to 30 June 2021

6.9.3 Performance Issues and Proposed Improvements

There were no traffic related incidents during the reporting period. No changes to traffic management at Hera are proposed for the following reporting period.

6.10 Heritage

6.10.1 Environmental Management

Aboriginal heritage at Hera is managed in accordance with the *Heritage Management Plan* (HMP), which is currently being updated as part of MOD 6 works. Non-Aboriginal heritage is managed as required. The following management measures are implemented for the management of unexpected heritage finds:

- All employees and contractors to Hera receive heritage training during site inductions;
- Ground disturbance permits are required when breaking ground and part of this process involves inspecting the site for heritage items;
- If any suspected Aboriginal or non-Aboriginal heritage sites, artefacts or spiritual places are found during ground clearing construction activities or mining, all work in the vicinity will cease immediately, and the unexpected finds procedure in the HMP will be implemented. The relevant agencies and Aboriginal stakeholders will be notified if required; and
- Activities will not recommence in the area of the find, until the relevant stakeholders have inspected the site and permission has been given to continue with the activity.

6.10.2 Environmental Monitoring Results

No heritage monitoring was required during the reporting period. Additionally, no unexpected finds were encountered during the reporting period.

6.10.3 Performance Issues and Proposed Improvements

There were no heritage related incidents during the reporting period. Review of current sites to be completed and preservation measures implemented if necessary in the next reporting period.

6.11 Visual, Stray Light

6.11.1 Environmental Management

Visual, stray light at the Mine is managed as required. The relative isolation of the Mine from surrounding residential locations and public vantage points, such as major roads, combined with the fact that topography and native vegetation limits the visibility of Hera, results in negligible visual/lighting impacts from the site. Notwithstanding, the following measures were implemented during the reporting period:


- Natural screening (e.g. trees) are not removed unless required; and
- Placement, intensity, and direction of lighting on the site are selected to reduce nuisance light.

6.11.2 Environmental Monitoring Results

No environmental monitoring for visual or lighting was required during the reporting period.

6.11.3 Performance Issues and Proposed Improvements

There were no visual or lighting related incidents during the reporting period. No changes to visual and lighting management at Hera are proposed for the following reporting period.

	Hera Annual Review 2020-2021	
	Author	B Topp (SLR) and J.Thompson (Hera)
	Reporting period	1 July 2020 to 30 June 2021

6.12 Bushfire

6.12.1 Environmental Management

Bushfire management at the site is managed as required. The following management measures are implemented for the management of bushfires at Hera:

- Fire breaks are maintained around the infrastructure and boundary fencing;
- A hot work permit is required for any work involving heat and/or naked flame;
- A Job Safety and Environment Analysis (JSEA) procedure is implemented to assess hazards in each step of a task, to establish suitable controls to manage identified hazards and appropriate tools, equipment, permits, PPE and reference documents required;
- Correct and safe storage of flammable and combustible fuels, chemicals and materials;
- Site-wide restriction on smoking and carrying of flame initiating devices;
- Deployment of suitably trained and experienced Site Emergency Response Team;
- Established links and protocols with nearby Cobar emergency response teams; and

6.12.2 Emergency Response Team (ERT) Fire Training (Certificate 3 in emergency response for all ERT members).Environmental Monitoring Results

No environmental monitoring for bushfires was required during the reporting period.

6.12.3 Performance Issues and Proposed Improvements

There were no bushfire related incidents during the reporting period. In the next reporting period, a firefighting trailer will be obtained for mine site and local use as well as additional training for the ERT in fire breaks and management.

6.13 Public Safety

6.13.1 Environmental Management

Public safety is managed at Hera as required. The following measures are implemented for the management of public safety at Hera:

- Perimeter fencing with gated entrances and warning signage has been installed as a barrier to prevent Public access to the Mine;
- Provision of swipe card access for the main entrance to the Mine;
- Entry restrictions apply to all persons under the age of 16 years;
- The Mill Control Centre is manned 24 hours a day, seven days a week; and
- Induction procedures are required for visitors to site.

6.13.2 Environmental Monitoring Results

No safety related monitoring was required during the reporting period.

6.13.3 Performance Issues and Proposed Improvements

There were no public safety related incidents during the reporting period. During the next reporting period, additional security fencing and gates for site security will be installed.

7 Water Management

7.1 Water Management

Water management for the reporting period was undertaken in accordance with the Hera Mine *Water Management Plan*. Water management details for the reporting period are summarised in **Table 21**.

Table 21 Water Management Details for the Reporting Period

Water Type	Storage	Volumes held (ML)			Usage
		Start of Reporting Period 1 July 2020	End of Reporting Period 30 June 2021	Storage Capacity (ML)	
Clean Water	Pete's Dam	0.8	3.0	3.2	Transferred to Process Water Dam as required.
	Back Dam East	4.0	100.0	108	
	Back Dam	3.0	5.8	6.5	
	Three Gates Dam	0.0	3.3	3.6	
	Total	7.8	112.1	121.3	
Raw Water	Back Tank	0.1	0.1	0.1	Receives raw water from WB8, back bore and WB21.
	Three Gates Tank	0.1	0.1	0.1	Receives raw water from WB24 and WB25.
	House Tank	0.02	0.02	0.02	Storage point from House Bore for use in exploration drilling.
	Feed Water Tank	0.2	0.24	0.24	Water Treatment Plant and underground Header Tank.
	Header Tank	0.1	0.1	0.1	Transfer underground.
	Total	0.52	0.56	0.56	
Contaminated water	Process Water Dam	4.3	5.1	5.3	Central source for Process Plant.
	Tailings Decant Pond	0.5	0.0	134.0	Decant water back into process system.
	Tailings Seepage Pond	0.0	0.0	1.8	Captures runoff from the TSF embankment, as well as providing protection of environment. Intercepted water is pumped to the TSF as required.
	WREA Leachate Dam	0.0	0.0	0.8	Protection of environment, seepage back into process system
	Expanded Sediment Basin	0.0	0.0	9.0	Captures dirty water runoff from Hera disturbance footprint.
	Total	4.8	5.1	150.85	

As shown in **Table 21**, the clean water dams are all close to capacity, which is attributed to the wetter than average recent conditions (refer **Section 6.1**). Importantly, contaminated water dams remain below capacity.

7.2 Surface Water Pollution

7.2.1 Environmental Management

Surface water at Hera is managed in accordance with the *Hera Mine Water Management Plan*. The surface water environment at Hera consists of four main water types; clean, raw, dirty, and contaminated water:

- **Clean water** includes runoff generated within undisturbed catchment areas within and upslope of the site. Water from clean water storages is transferred to the Process Water Dam for industrial use on-site;
- **Raw water** is used for operational purposes and is generally clean. Raw water at Hera is supplied from production bores around the site;
- **Dirty water** is defined as runoff from the disturbed footprint that has not come into contact with pollutants such as arsenic or cyanide. The dirty water management systems consist of a series of dirty water drains. The dirty water storage onsite at Hera is the Sediment Basin; and
- **Contaminated Water** is categorised by the increased likelihood of elevated concentrations of cyanide and arsenic. There is no active treatment of this water with all captured volumes reused in process activities.

A summary of surface water management activities during the reporting period are summarised below:

- Fuels and oils are stored in purpose-built facilities with appropriate bunding to minimise the potential for accidental discharging of hydrocarbons into the surrounding environment. Diesel is stored in above ground self-bunded tanks from where it is transferred direct to machinery. A licenced contractor is engaged to remove and recycle and/or dispose of used oil and grease products at licensed facilities;
- Once per quarter and after significant rainfall (> 25 mm in 24-hours), a site walkover and assessment of all surface water structures is undertaken;
- Visual inspections of upstream and downstream waterways are undertaken at a number of locations in association with surface water quality monitoring to identify any instabilities that have formed as a result of the operations; and
- Installation of a 13.7 ha, 204 to embankment crest (168 to spillway crest) ML Water Management Dam to act as an external decant pond for the existing TSF.

Hera undertakes surface water quality monitoring at several locations within the site (refer **Figure 18** and **Table 22**). EPL 20179 requires surface water quality sampling be undertaken at two locations within the contaminated water system (EPA point 1 and EPA point 2); one location within the dirty water system which is the Sediment Basin (EPA point 3 and EPA point 4); and two locations within the surrounding clean water system (EPA point 25 and EPA point 26). EPA point 3 and EPA point 4 are no longer in place and Hera is a zero-discharge site. A request has been made to the EPA to remove these discharge points from EPL 20179 however, no response has been received to date.

Table 22 Surface Water Monitoring Points

EPA Point No. and Location	Frequency	Parameters
EPA 1, Discharge to TSF	Daily during any discharge	Cyanide (weak acid dissociable)
EPA 2 Discharge to PWD		
EPA 3 Sediment Basin 1	During discharge	EC, pH, TSS, Cyanide (weak acid dissociable), Al, As, B, Cd, Cu, Pb, Mn, Ni, N (total), Oil and grease, Ag, Total P (filtered), Zn
EPA 4 Sediment Basin 2		
EPA 25 Surface Quality Monitoring Point (Upstream)	During discharge	EC, pH, TSS, Cyanide (weak acid dissociable), Al, As, B, Cd, Cu, Pb, Mn, Ni, N (total), Oil and grease, Ag, Total P (filtered), Zn
EPA 26 Surface Quality Monitoring Point (Downstream)		

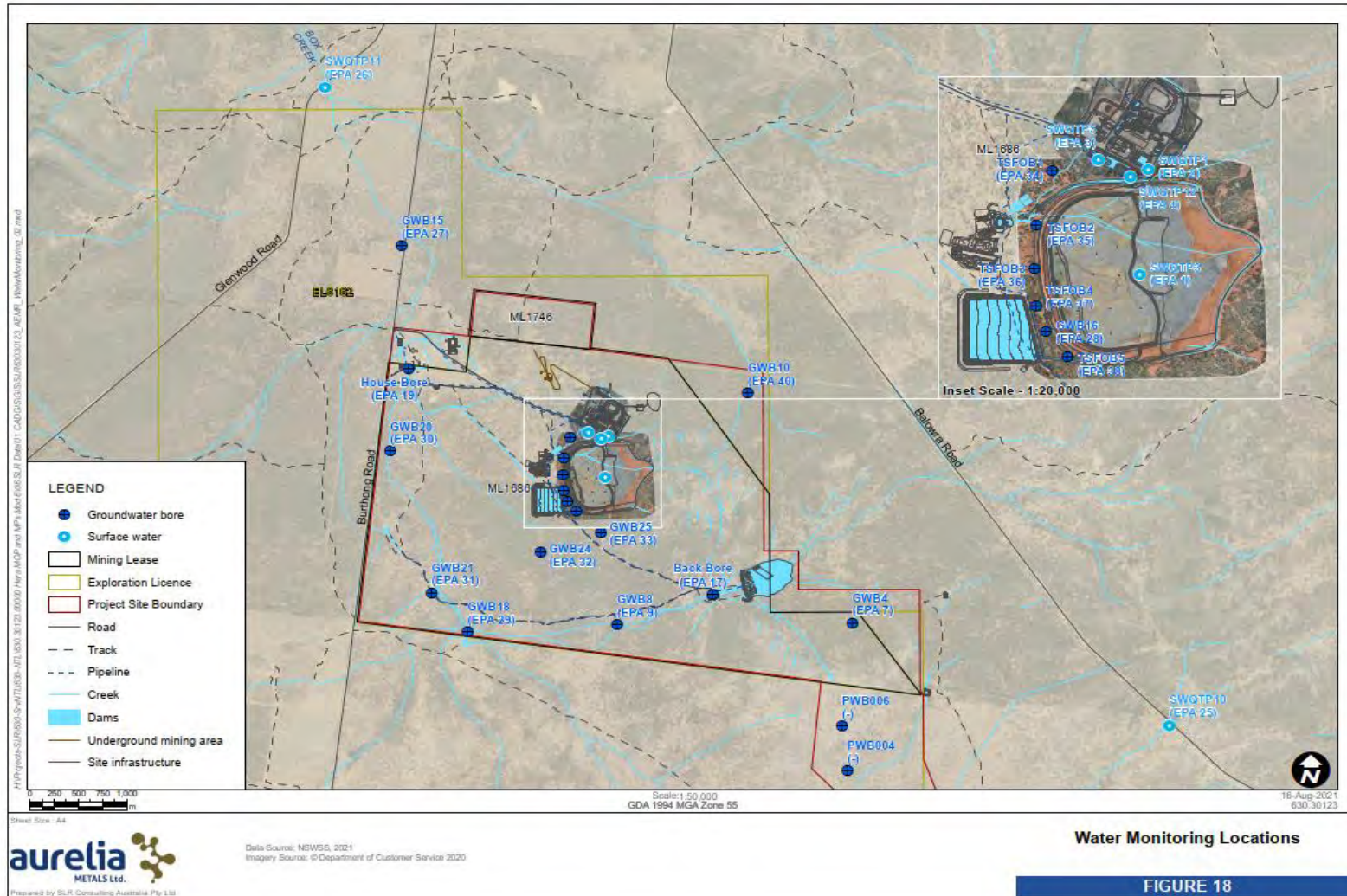


Figure 18 Water Monitoring Locations

7.2.2 Environmental Monitoring Results

During the reporting period there were no discharges from the sediment basin.

Table 23 presents a summary of the monitoring results for EPA Points 1 and 2, which were monitored during the reporting period. Results are also reported to the EPA annually as part of the EPL Annual Return.

Table 23 Surface Water Monitoring Results

Monitoring Point	Minimum (mg/L)	Average (mg/L)	Maximum (mg/L)	EPL Criteria (mg/L)
TSF Thickener Discharge (EPA Point 1)	0	0.16	14	20
Process Water Dam (EPA Point 2)	0	0.08	5.31	20

As shown in **Table 23**, there were no exceedances of the TSF Thickener Discharge Point and Process Water Dam criteria during the reporting period.

7.2.3 Performance Issues and Proposed Improvements

One surface water-related incident occurred during the reporting period, as outlined below:

- On 17 March 2021 Hera advised the DPIE that the mine had been trucking raw water from offsite sources for operational mining purposes. The non-compliance was identified following an investigation of raw water cartage to site and it was determined that this activity was in contravention of Schedule 2, Condition 2 of the consent. In response to DPIE’s request for information, Hera advised that the raw water has been intermittently trucked from offsite sources in the past and that this ceased once the breach was identified. Consequently, DPIE determined that as the development had not been carried out in general accordance with the EA, a breach of Section 4.2(1)(b) of the Act had occurred. A penalty notice was issued in the amount of \$15,000. The penalty was paid.

Proposed Improvements:

Raw water cartage to Hera has ceased. No additional changes from those discussed to water management onsite are proposed in the next reporting period.

7.3 Groundwater Pollution

7.3.1 Environmental Management

Groundwater at Hera is managed in accordance with the *Hera Mine Water Management Plan*. A summary of groundwater management activities during the reporting period are summarised below:

- Managing the TSF and process plant in accordance with the *Hazardous Materials Management Plan* to ensure no leaching of acid, heavy metals, or cyanide into groundwater;
- Managing the WREA in accordance with the *Waste Rock Management Plan* to ensure no leaching of acid and heavy metals from waste rock into groundwater;
- Storing fuels and oils in purpose-built facilities with appropriate bunding to minimise the potential for accidental discharging of hydrocarbons into the surrounding environment. Diesel is stored in above ground self-bunded tanks from where it is transferred direct to machinery; and
- Six groundwater bores were drilled for production. Two are used as production bores, one is being used as a groundwater monitoring bore, one is unusable and a decision is to be made on the remaining two bores. There is potential to turn those bores into deep groundwater monitoring bores.

A Groundwater Monitoring Program is outlined in the *Water Management Plan* and includes monitoring of groundwater level and quality at the bores and frequencies listed in **Table 24**.

Table 24 Groundwater Monitoring Program

Location	Frequency	Parameter
EPL monitoring points		
WB4 (EPA 7), WB10 (EPA 40), Back Bore (EPA 17)	Quarterly	SWL
WB4 (EPA 7), WB8 (EPA 9), WB10 (EPA 10), Back Bore (EPA 17), House Bore (EPA 19)	Quarterly	EC, pH, TSS, As, HCO ₃ , B, Cd, Ca, CO ₃ , Cl, Cr, Cu, Cyanide (free, total & WAD), Fe, Pb, Mg, Hg, Mn, Mo, Ni, K, Ag, Na, Sb, Sn, Zn
TSF monitoring bores: TSFOB1, TSFOB2, TSFOB3, TSFOB4, TSFOB5, WB16	Quarterly (sample when water is present)	SWL, EC, pH, TSS, As, HCO ₃ , B, Cd, Ca, CO ₃ , Cl, Cr, Cu, Cyanide (free, total & WAD), Fe, Pb, Mg, Hg, Mn, Mo, Ni, K, Ag, Na, Sb, Sn, Zn
Additional monitoring		
WB4, WB15, WB18, WB20	Monthly	SWL
TSF monitoring bores: TSFOB1, TSFOB2, TSFOB3, TSFOB4, TSFOB5, WB16	Monthly (sample when water is present)	SWL, EC, pH, TSS, As, HCO ₃ , B, Cd, Ca, CO ₃ , Cl, Cr, Cu, Cyanide (free, total & WAD), Fe, Pb, Mg, Hg, Mn, Mo, Ni, K, Ag, Na, Sb, Sn, Zn

7.3.2 Environmental Monitoring Results

7.3.2.1 Monitoring During the Reporting Period

Groundwater Monitoring

Quarterly standing water levels, pH and Electrical Conductivity (EC) results for the reporting period are summarised in **Table 25** below. TSFOB01, TSFOB02, TSFOB03, TSFOB04 and TSFOB05 were dry at every monitoring period.

Table 25 Groundwater Monitoring Results

Monitoring Point	Month	SWL Limit (m)	Depth to Water (m)	pH	EC (mS)
WB4	September 2020	63	54.38	6.8	5.31
	December 2020		54.85	6.8	5.21
	March 2021		55.52	6.8	5.68
	June 2021		55.86	7.0	5.86
WB15	September 2020	58	57.91	7.0	6.04
	December 2020		58.02	7.1	6.16
	March 2021		58.36	6.9	6.37
	June 2021		*	*	*
WB18	September 2020	65	70.39	#	#
	December 2020		71.23	#	#
	March 2021		#	#	#
	June 2021		73.05	7.3	1.84
WB20	September 2020	69	62.69	7.1	7.03
	December 2020		63.64	7.1	7.38
	March 2021		65.51	7.0	7.45
	June 2021		65.87	7.1	7.54

* No safe access

Blocked at 61m

During the reporting period, the standing water level (SWL) trigger level at WB15 was exceeded. This trigger indicates there is potential that neighbouring bores have been impacted. In consultation with DPIE and NRAR, Hera Resources communicated with the landholder our intentions to supply a compensatory supply if they required. To date, the neighbour has not requested a compensatory supply.

Water Take

A summary of the water taken by Hera during the previous water year (i.e. 1 July 2020 – 30 June 2021) is provided in **Table 26**.

Table 26 Water Take

Water Licence	Water sharing plan, source and management zone	Entitlement	Passive take/ inflows	Active pumping	TOTAL
WAL 43173	Lachlan Fold Belt Murray Darling Basin Groundwater Source (Aquifer)	543 ML/year	61.63 ML	210.14 ML	271.77 ML

A total of 271.77 ML of groundwater was extracted from the bores and underground decline dewatering, which was well within the 543 ML limit. A summary of water extraction per bore during the reporting period is provided in **Table 27**.

Table 27 Groundwater Extraction Per Bore

Bore	Volume (ML)	Pumped/Passive
Back Bore	0.0	Pumped
House Bore	4.63	Pumped
Nymagee Bore	0.51	Pumped
WB 8	14.9	Pumped
WB 10	2.22	Pumped
WB 17	5.09	Pumped

WB 21	18.42	Pumped
WB 24	7.05	Pumped
WB 25	30.98	Pumped
WB 26	22.94	Pumped
WB 27	35.63	Pumped
WB 28	34.36	Pumped
Exploration bores	33.41	Pumped
Underground Decline	61.63	Passive
Total	271.77	-

Table 28 presents a summary of water usage onsite and a comparison to the water balance. Water usage is reduced onsite where possible and bore water usage is minimised. Underground mine dewatering water is recycled and re-used underground as make-up water, excess underground mine dewatering water flows into the Process Water Dam for use in the process plant. Bore water is used for creation of potable water, dust suppression, pump gland water and underground make-up water (minimised where possible).

Table 28 Summary of Water Flows Onsite and Comparison to the Water Balance

Date	Rainfall (mm)		Underground Make Up Water Demand (ML)		Underground Mine Water Excess (ML)		Ablutions Demand (ML)	
	Actual	Water Balance Prediction	Actual	Water Balance Prediction	Actual	Water Balance Prediction	Actual	Water Balance Prediction
July - 20	6.2	30	6.92	1.4	5.79	6.4	1.84	0.5
Aug - 20	39.2	30	5.8	1.4	6.46	6.4	1.86	0.5
Sep - 20	41.4	30	6.7	1.4	6.19	6.4	1.7	0.5
Oct - 20	8.8	30	7.43	1.4	6.01	6.4	1.88	0.5
Nov - 20	7.8	30	9.35	1.4	4.49	6.4	1.67	0.5
Dec - 20	53.4	30	9.78	1.4	4.50	6.4	2.44	0.5
Jan - 21	53.2	30	10.73	1.4	2.87	6.4	2.02	0.5
Feb - 21	59.2	30	9.1	1.4	2.54	6.4	1.57	0.5
Mar - 21	102.8	30	8.09	1.4	6.58	6.4	1.89	0.5
Apr - 21	0.2	30	8.73	1.4	4.45	6.4	1.76	0.5
May - 21	15.6	30	9.02	1.4	5.23	6.4	2.04	0.5
Jun - 21	82.8	30	8.6	1.4	4.26	6.4	1.85	0.5
Total	470.6	360	100.25	16.8	61.63	77.1	22.52	6.0
Difference (%)	130.72 %		596.72 %		77 %		375.33 %	

7.3.2.2 Long Term Monitoring

Figure 19 presents a summary of the standing water level results for the life of mine at Hera, which shows that standing water levels have remained relatively stable and only increased slightly over the last three years.

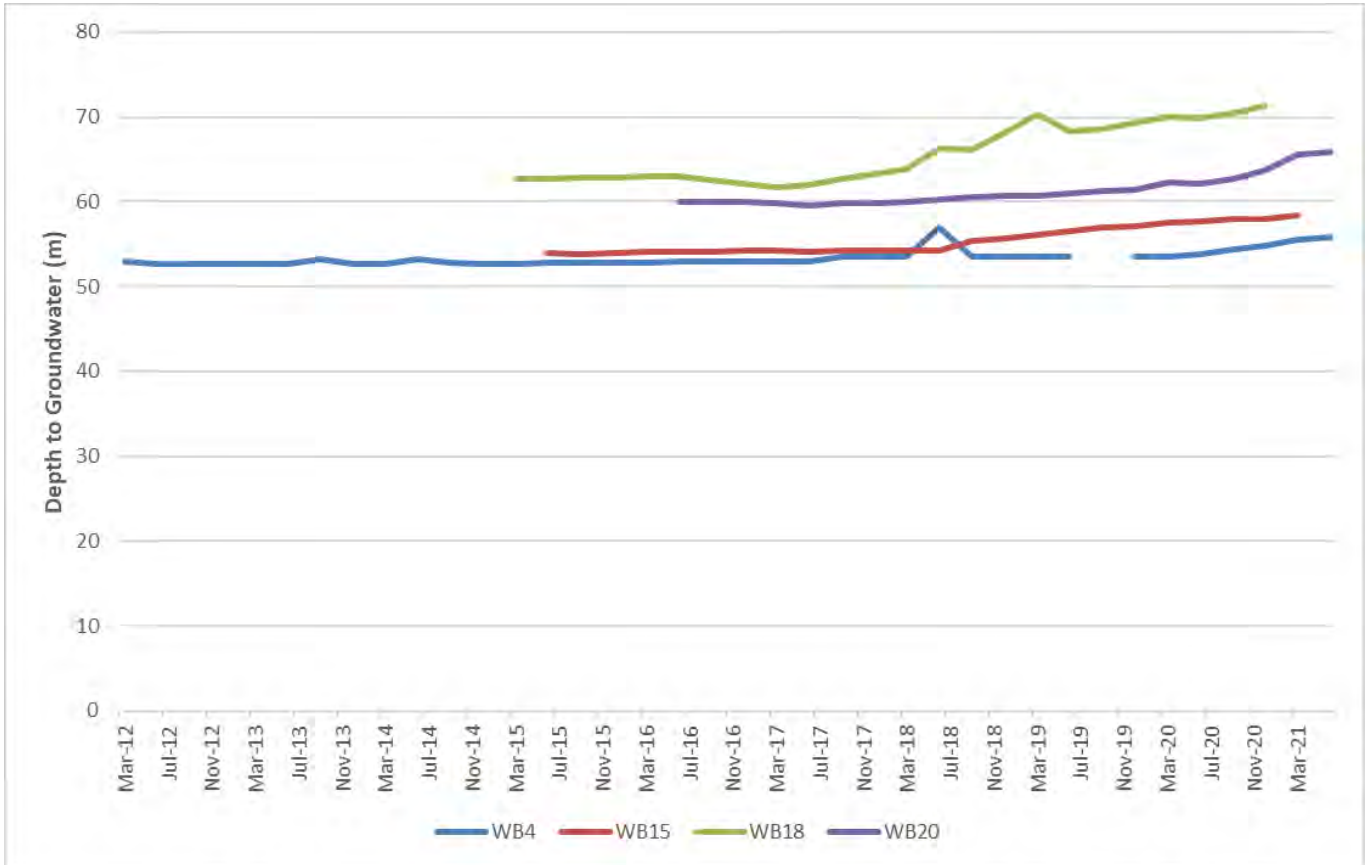


Figure 19 Summary of standing water levels for the life of mine at Hera Mine

Figure 20 and **Figure 21** present the groundwater pH and EC for the life of mine at Hera. The results are variable over the period of time.

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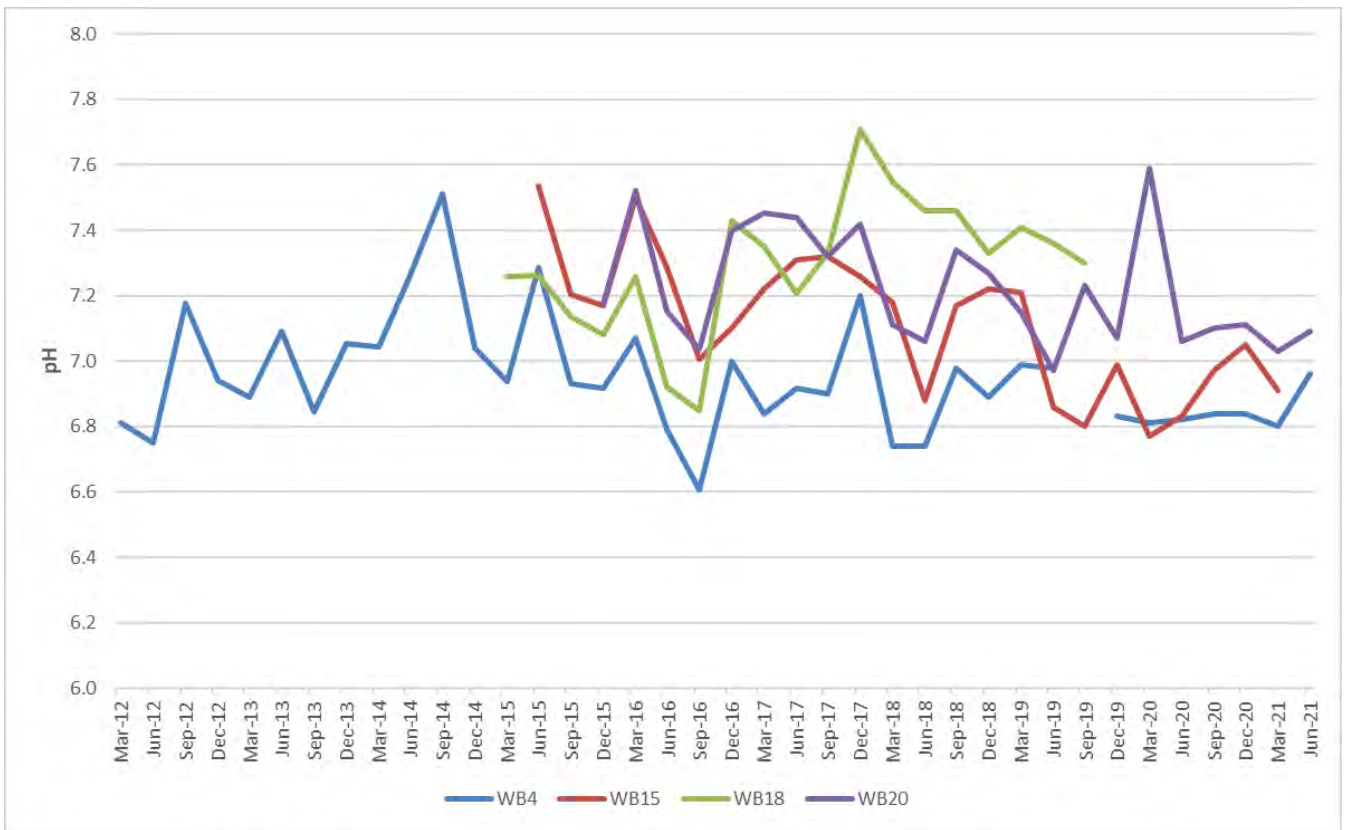


Figure 20 Summary of the groundwater pH for the life of mine at Hera Mine

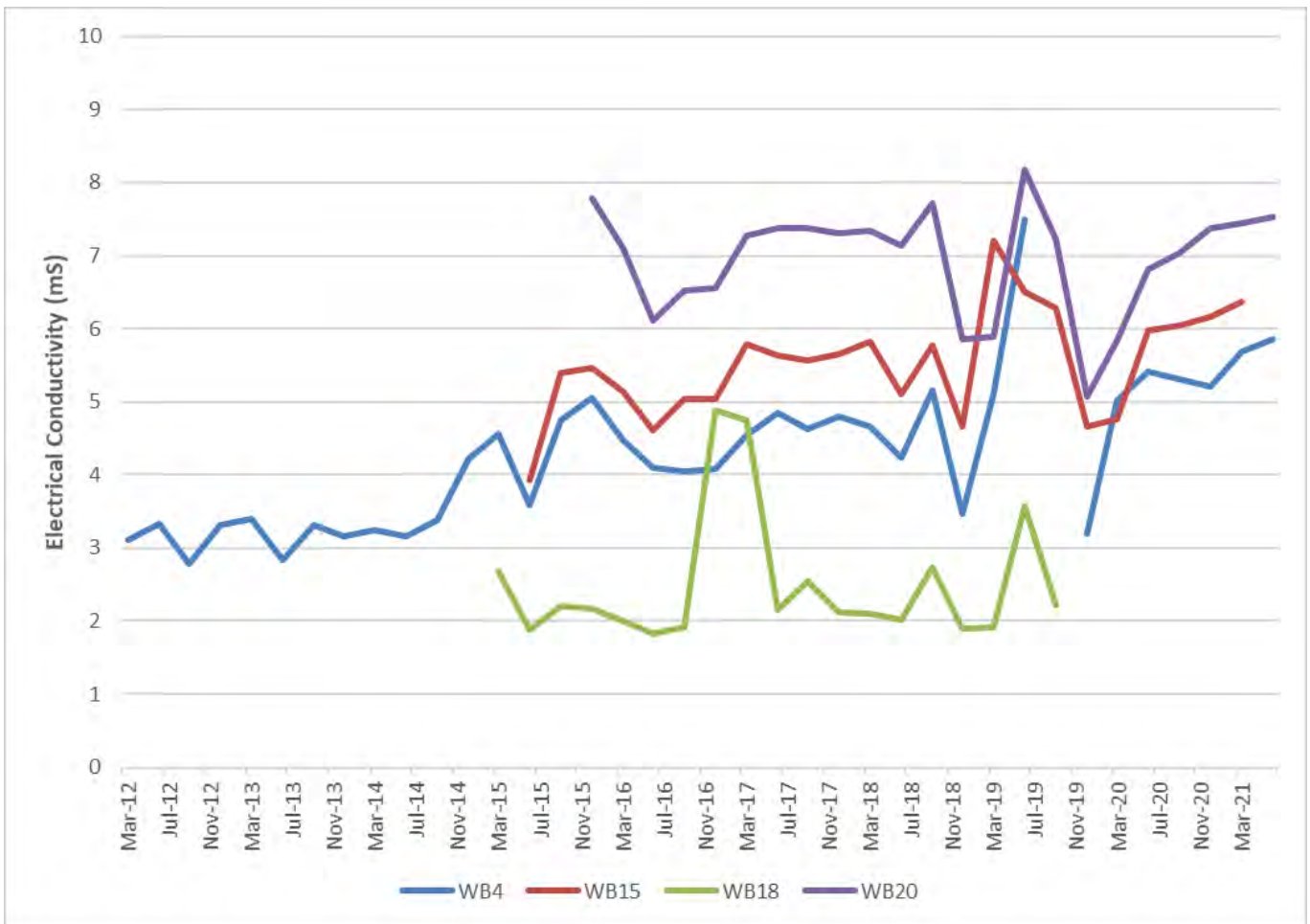


Figure 21 Summary of the Groundwater Electrical Conductivity for the life of mine at Hera Mine

Groundwater Take

Figure 22 presents a summary of the groundwater production for the last six financial (water) years. Groundwater production monitoring prior to this time was deficient and insufficient data is available to present. Groundwater production has significantly decreased from the previous water year (353.7 ML).

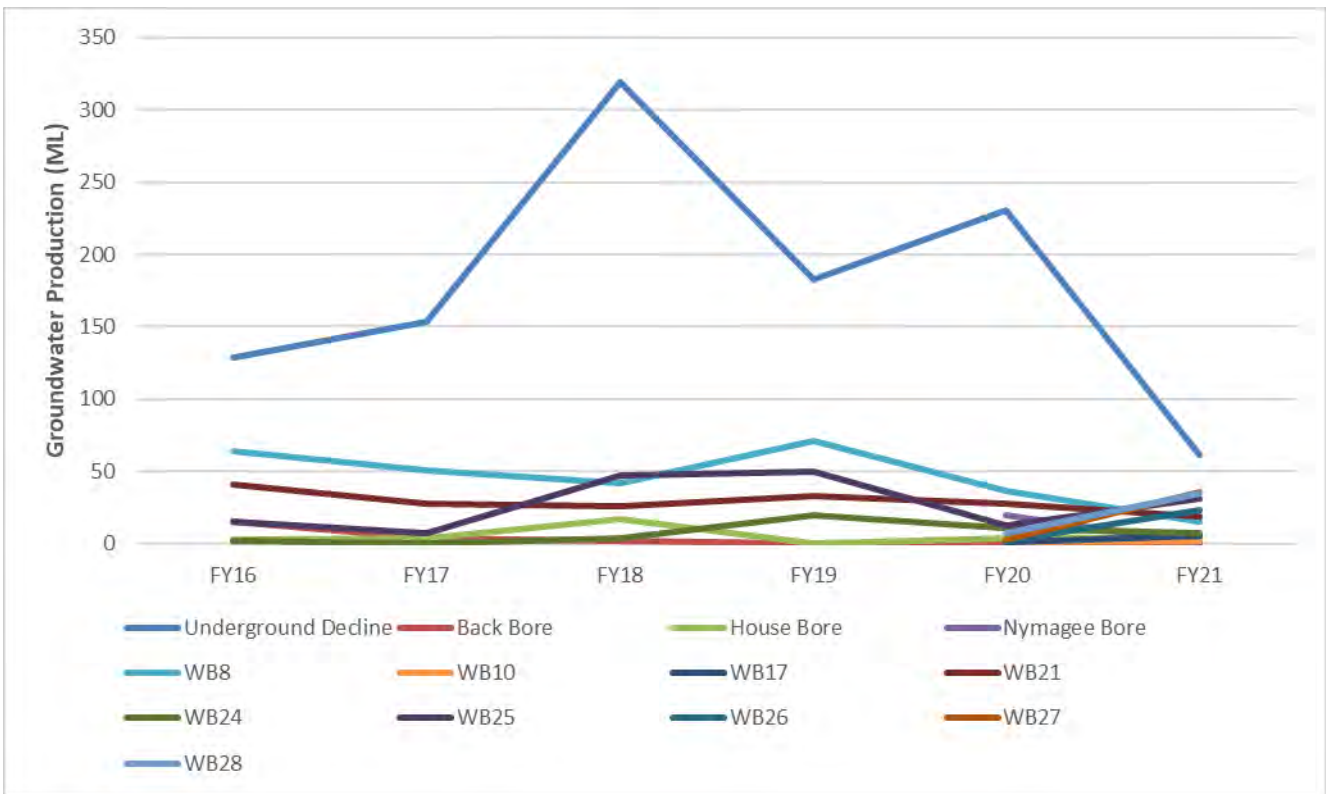


Figure 22 Summary of Groundwater production for the life of the mine

7.3.3 Performance Issues and Proposed Improvements

No groundwater incidents were recorded during the reporting period. In the next reporting period, a program of cleaning bores, replacing sensors, installation of solar panels and level sensors for automatic operation of the pump in accordance with the trigger level will be undertaken.

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8 Rehabilitation

8.1 Buildings and Infrastructure

No buildings or mine infrastructure were demolished during the reporting period.

8.2 Rehabilitation of Disturbed Land

Hera has only disturbed land directly required for current mining operations. Therefore, no significant rehabilitation of disturbed land is planned until mine closure. Progressive rehabilitation will only be undertaken in sections of the mine no longer required for mining purposes, if areas become available. This aligns with the commitments made in the approved MOP, which state that no rehabilitation is planned to be undertaken during the MOP term.

8.3 Rehabilitation Trials and Research

During the reporting period Hera decommissioned the TSF column trials and completed a capillary rise assessment with the expert assistance of SGM Environmental. The column trials were being undertaken to determine the most appropriate cap thickness on the TSF upon mine closure. Trial simulated rainfall was applied until the trials reached saturation point. Each trial contained tailings and a different thickness cap (0.2m, 0.4m, 0.6m and 0.8m). The 0.8m trial was constructed outside and is shown below in **Photo 1**. The intermediate bulk container (IBC) was placed on stacked pallets which were slightly graded so that seepage flows toward a drainage tap at the base of the trial. The column was ~1 m tall and had a surface area of ~1.17 m².

The trials indicated that the 0.6 m cap was most suitable for rehabilitation purposes. During the previous reporting period it was found that increasing the cover thickness from 0.6 m to 0.8 m is likely to improve seepage from less than 1% to near 0%. The sensitivity analysis showed that cover performance is unlikely to improve beyond 0.8 m, and may start to decline at cover thicknesses equal to or greater than 1 m. The optimum cover thickness is therefore between 0.6-0.8 m. At this stage, the recommended cover thickness is 0.6 m (SGM, 2019).

During decommissioning of the IBC cover trials, sampling for capillary rise was undertaken. There was evidence of capillary rise of salts, acidity and some metals/metalloids in both the 0.4 and 0.6m covers. The 0.4m cover is considered likely to fail because capillarity will limit plant growth. Noting that the 0.4m cover has been disbanded as a preferred cover based on its performance in the IBC trials and was not recommissioned in the steel column trials. EC was elevated at the base of the 0.6m cover making 0.4m available to support plant growth. Notwithstanding, the need for a capillary break layer in the cover is inconclusive at this stage. The capillary rise assessment recommended that Hera monitors the 0.6 and 0.8m covers in the steel column trials for capillary rise of salts, acidity, metals and metalloids.



Photo 1 TSF Column Trial (0.8m)

8.4 Further Development of the Final Rehabilitation Plan

A summary of rehabilitation activities is provided in **Table 29**. The current MOP is approved until 2022 and was amended since the reporting period concluded to include the MOD 6 activities.

PA 10_0191 permits mining operations until 31 December 2025. As a result, final rehabilitation is not expected to occur during the term of the current approved MOP. Hera Resources will commence the detailed mine closure planning process at least 5 years prior to the anticipated mine closure date (i.e. the planned cessation of mining), with a closure MOP being prepared two years prior to the expected mine closure date.

Hera Resources is in the process of developing an environmental impact statement (EIS) for the proposed Federation Mine. As part of this proposal, the existing infrastructure at Hera is proposed to be utilised wherever possible. This will extend the use of the site footprints, TSF and process plant at Hera.

Table 29 Summary of Rehabilitation Activities

Mine Area Type		Area Affected/Rehabilitated (ha)		
		Previous Reporting Period (Reported)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
A	Total Mine Footprint¹	97.65	116.44	130.47
B	Total Active Disturbance²			
B1	Infrastructure	19.8	34.5	35.46
B2	Tailings Storage Facility	48.7	46.65	46.65
B3	Water Management Areas	17.7	21.46	30.64
B4	Waste Rock Emplacement	1.7	1.69	1.69
B5	Stockpiled Material (soil)	9.25	11.65	13.41
B6	Void	0.5	0.49	2.63
	TOTAL	97.6	116.44	130.47
C	Land Being Prepared For Rehabilitation³	0	0	0
D	Land Under Active Rehabilitation⁴	0	0	0
E	Completed Rehabilitation⁵	0	0	0

Notes:

1. Total mine footprint includes all areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities.
2. Total active disturbance includes all areas ultimately requiring rehabilitation.
3. Land being prepared for rehabilitation – includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development (as defined in DRE MOP Guidelines).
4. Land under active rehabilitation - includes areas under rehabilitation and being managed to achieve relinquishment – includes the following rehabilitation phases as described in the DRE MOP Guidelines – ecosystem and land use establishment and ecosystem and land use sustainability.
5. Completed rehabilitation – requires formal sign-off by DRE that the area has successfully met the rehabilitation land use objectives and completion criteria.

9 Community

9.1 Environmental Complaints

One complaint was received during the reporting period. The EPA contacted Hera in regard to a complaint received from a neighbouring property. The complaint related to a blast that occurred at 1:05PM on Sunday 26 July 2020. The blast in question was compliant.

Figure 23 presents a summary of the complaints received at Hera since 2011-2012. Complaints peaked in 2016-2017 and had been reducing since, until the 2019-2020 reporting period when nine complaints were received.

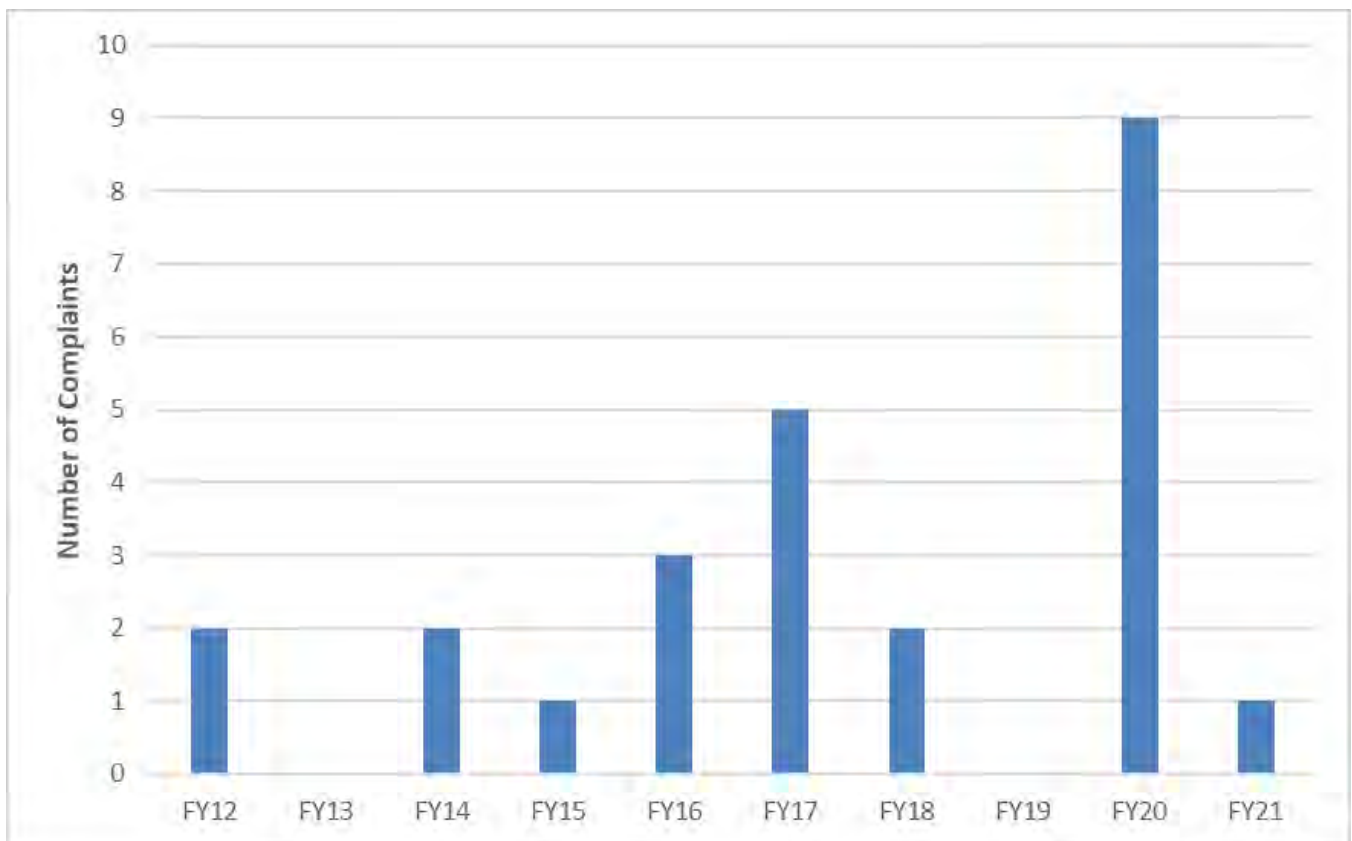


Figure 23 Summary of complaints received for the life of the Hera Mine

9.2 Community Liaison

Hera recognises its responsibilities as a member of the Nymagee community and surrounding region and demonstrates this through a range of community contacts, provisions and interactions. A summary of this involvement is presented in **Table 30**.

Table 30 Summary of Community Consultation During the Reporting Period

Forum	Consultation/Contribution
Nymagee and surrounds	<p>General Community Involvement including:</p> <ul style="list-style-type: none"> • Hera is one of the largest employers in the local region and recognises this by employing local residents where possible and sourcing contractors from the local region; • Regular attendance to the Nymagee Progress Association which is held on a monthly basis; • Provision of waste management services to Nymagee for general and septic waste; and • Regular attendance to the Cobar Local Emergency Management Committee held on a quarterly basis.
Financial contributions and donations	<p>Financial contributions made during the reporting period included:</p> <ul style="list-style-type: none"> • Nymagee Christmas Tree; • Nymagee Progress Association; • Nymagee Flower Show; • Nymagee CWA; • Nymagee Cricket Club; • Donation of a laptop to Nymagee Library; • Donation to Hermidale community for school student scholarships; and • Donation to Festival of Small Halls.
Community Consultative Committee (CCC) Meetings	<p>Hera held four CCC meetings during the reporting period. Meetings were held in September 2020, December 2020, March 2021 and June 2021. The CCC meetings are chaired by an Independent Chairperson approved by DPIE and attended by community representatives approved by the Department to discuss the environmental and operational progress of the mine and provide an opportunity to discuss any concerns the Community may have.</p>
Company website	<p>The Company operate and update a website where it provides operational, environmental and cash flow reports, environmental monitoring data, management plans and independent audits.</p>

10 Independent Audit

Independent Environmental Audits (IEA) occur at Hera every three years with the last one being conducted in late 2019. All actions identified during the audit that **are not currently completed** have been summarised in **Table 31** below with an update on progress. A copy of the full IEA has been attached as **Appendix E**.

Table 31 Summary of Actions Identified during the IEA that are not yet completed

Condition	Assessment	Recommendation	Hera Resources Action Plan	Hera Action Due Date	Hera Action Update
PA 10_0191 S3.40	<p>The September 2016 IER found that a Final Hazards Analysis (FHA) had not been completed. The recommendation to complete a final hazard analysis has not been actioned. A Preliminary Hazard Analysis (PHA) was completed by RW Corkery & Co as part of the EA (Nov. 2011) (sighted). Section 5.1 of the Hazardous Materials Management Plan states that “As there are no changes to the design of the Mine, the PHA is considered by Hera Resources to be sufficient to satisfy the requirement of Condition 3(40) of Project Approval whereby a Final Hazards Analysis was to be prepared”.</p> <p>The previous audit in July 2013 noted: “As the Hazardous Materials Management Plan has been approved by the Director-General, YTC Hera is compliant with this condition.”</p> <p>However, the 2013 audit was conducted prior to the construction and operation of the processing plant; an area where the majority of the hazardous materials are stored or used. At the time of the audit in September 2016, it was observed that there are hazardous goods (e.g. LNG Class 2.1) and processes (e.g. Meta Foundries – gold room) that were not identified in the original PHA.</p>	Conduct a Final Hazard Analysis in accordance with Hazardous Industry Planning Advisory Paper No. 5 – Hazard Audit Guidelines	Conduct a Final Hazard Analysis in accordance with Hazardous Industry Planning Advisory Paper No. 5 – Hazard Audit Guidelines.	30 September 2020.	The Final Hazard Analysis is currently being finalised for submission.
EPL 20179 M2.1	Refer to Conditions M2.2 and M2.3 below.	Refer to Condition M2.3 below.	Prepare a document that details all environmental monitoring required (for compliance purposes) include details of sampling location, sample type, identify person	4 April 2021.	Ongoing

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			(or organisation) responsible for sampling and analysis. Set up a system to automatically notify the Environmental Manager of up-coming sampling events.		
EPL 20179 M2.3	2018/19: On 5 occasions testing for Weak Acid Dissociable (WAD) Cyanide within the detox circuit when discharging to the tailing's storage facility, was not undertaken. 2017/18: Licence Points 1 and 2 were not sampled during daily discharge. Sample Point 27 were not tested quarterly for electrical conductivity	Prepare a document that details all environmental monitoring required (for compliance purposes) include details of sampling location, sample type, identify person (or organisation) responsible for sampling and analysis. Set up a system to automatically notify the Environmental Manager of up-coming sampling events.	Prepare a document that details all environmental monitoring required (for compliance purposes) include details of sampling location, sample type, identify person (or organisation) responsible for sampling and analysis. Set up a system to automatically notify the Environmental Manager of up-coming sampling events.	4 April 2021.	Ongoing

11 Incidents and Non-Compliances During the Reporting Period

A summary of incidents and non-compliances have been provided in **Table 32** below. Further detail is provided in the relevant sub-sections of **Section 6** and **Section 7**.

Table 32 Summary of Incidents and Non-Compliances during the Annual Review Period

Date	Category	Summary of Incident/Non-Compliance	Reported to:	Section Addressed
10 March 2021	Water	On 17 March 2021 Hera advised the DPIE that the mine had been trucking raw water from offsite sources for operational mining purposes. Following an investigation of raw water trucking, Hera Resources identified that this was in contravention of Schedule 2, Condition 2 of the consent and immediately ceased this activity. Consequently, the Department determined that as the development had not been carried out in general accordance with the EA, a breach of Section 4.2(1)(b) of the Act had occurred. A penalty notice was issued in the amount of \$15,000. The penalty has been paid.	DPIE	Section 7.2.3
1 September 2020	Air Quality	On 1 September 2020, the EPA ID 24 – Gold Room Scrubber Stack recorded a Mercury result of 0.26 mg/m ³ which was confirmed with the issue of the Ektimo Pty Ltd report on 5 November 2020 for Company review. This scrubber stack is analysed yearly as per EPL 20179 Condition M2.2. PA 10_0191 Condition 13, Schedule 3 dictates that the Company shall ensure that all point-source discharge locations on the site are designed and operated to comply with the maximum discharge concentrations applicable under the Protection of the Environment (Clean Air) Regulation 2010 and the requirements of any Environmental Protection Licence issued for the project under the POEO Act. The Gold Room Scrubber Stack falls under Part 5: Air impurities emitted from activities and plant, Division 4 Group 6 treatment plants. Mercury has a Group 6 standard concentration limit of 0.2 mg/m ³ .	DPIE	Section 6.2.3

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12 Activities to be Completed in the Next Reporting Period

During the next reporting period, mining activities and operations at the site will continue as per current operations outlined in **Section 4**. In accordance with the approved MOP, no rehabilitation is planned for the following reporting period.

Table 33 provides a summary of proposed activities for the next Annual Review reporting period.

Table 33 Activities Proposed for the Next Annual Review Reporting Period

Proposed activity	Timing
Production bore improvement works	August 2021
Hera to Federation pipeline (MOD 6)	FY 2022
Magazine relocation (MOD 6)	FY 2022
Surface Extraction Area (MOD 6)	FY 2022

Appendix A Water Quality Monitoring Results

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
01-07-2020	0	0	
02-07-2020	0	0	
03-07-2020	0	0	
04-07-2020	0	0	
05-07-2020	0	0	
06-07-2020	0	0	
07-07-2020	0	0	
08-07-2020	0	0	
09-07-2020	0	0	
10-07-2020	0	0	
11-07-2020	0	0	
12-07-2020	0	0	
13-07-2020	0	0	
14-07-2020	0	0	
15-07-2020	0	0	
16-07-2020	0	0	
17-07-2020	0	0	
18-07-2020	0	0	
19-07-2020	0	0	
20-07-2020	0	0	
21-07-2020	0	0	
22-07-2020	NR	0	No daily discharge
23-07-2020	0	0	
24-07-2020	0	0	
25-07-2020	0	0	
26-07-2020	0	0	
27-07-2020	0	0	
28-07-2020	0	0	
29-07-2020	0	0	
30-07-2020	0	0	
31-07-2020	0	0	
01-08-2020	0	0	
02-08-2020	0	0	
03-08-2020	0	0	
04-08-2020	0	0	
05-08-2020	0	0	
06-08-2020	0	0	
07-08-2020	NR	0	No daily discharge
08-08-2020	NR	0	No daily discharge
09-08-2020	0	0	
10-08-2020	0	0	
11-08-2020	0	0	
12-08-2020	0	0	

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
13-08-2020	0	0	
14-08-2020	0	0	
15-08-2020	0	0	
16-08-2020	0	0	
17-08-2020	0	0	
18-08-2020	0	0	
19-08-2020	0	0	
20-08-2020	0	0	
21-08-2020	0	0	
22-08-2020	0	0	
23-08-2020	0	0	
24-08-2020	0	0	
25-08-2020	0	0	
26-08-2020	0	0	
27-08-2020	0	0	
28-08-2020	0	0	
29-08-2020	0	0	
30-08-2020	0	0	
31-08-2020	0	0	
01-08-2020	0	0	
02-08-2020	0	0	
03-08-2020	0	0	
04-08-2020	0	0	
05-08-2020	0	0	
06-08-2020	0	0	
07-08-2020	NR	0	No daily discharge
08-08-2020	NR	0	No daily discharge
09-08-2020	0	0	
10-08-2020	0	0	
11-08-2020	0	0	
12-08-2020	0	0	
13-08-2020	0	0	
14-08-2020	0	0	
15-08-2020	0	0	
16-08-2020	0	0	
17-08-2020	0	0	
18-08-2020	0	0	
19-08-2020	0	0	
20-08-2020	0	0	
21-08-2020	0	0	
22-08-2020	0	0	
23-08-2020	0	0	
24-08-2020	0	0	
25-08-2020	0	0	
26-08-2020	0	0	
27-08-2020	0	0	

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
28-08-2020	0	0	
29-08-2020	0	0	
30-08-2020	0	0	
31-08-2020	0	0	
01-10-2020	0	0	
02-10-2020	0	0	
03-10-2020	0	0	
04-10-2020	0	0	
05-10-2020	0	0	
06-10-2020	0	0	
07-10-2020	0	0	
08-10-2020	0	0	
09-10-2020	0	0	
10-10-2020	0	0	
11-10-2020	0	0	
12-10-2020	0	0	
13-10-2020	0	0	
14-10-2020	0	0	
15-10-2020	0	0	
16-10-2020	0	0	
17-10-2020	0	0	
18-10-2020	0	0	
19-10-2020	0	0	
20-10-2020	NR	0	No daily discharge
21-10-2020	NR	NR	No daily discharge
22-10-2020	NR	NR	No daily discharge
23-10-2020	0	0	
24-10-2020	0	0	
25-10-2020	0	0	
26-10-2020	0	0	
27-10-2020	0	0	
28-10-2020	0	0	
29-10-2020	0	0	
30-10-2020	0	0	
31-10-2020	0	0	
01-11-2020	0	0	
02-11-2020	0	0	
03-11-2020	0	0	
04-11-2020	0	0	
05-11-2020	0	0	
06-11-2020	0	0	
07-11-2020	0	0	
08-11-2020	0	0	
09-11-2020	0	0	
10-11-2020	0	0	
11-11-2020	0	0	

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
12-11-2020	0	0	
13-11-2020	0	0	
14-11-2020	0	0	
15-11-2020	0	0	
16-11-2020	0	0	
17-11-2020	0	0	
18-11-2020	0	0	
19-11-2020	0	0	
20-11-2020	0	0	
21-11-2020	0	0	
22-11-2020	0	0	
23-11-2020	0	0	
24-11-2020	0	0	
25-11-2020	0	0	
26-11-2020	NR	0	No daily discharge
27-11-2020	NR	0	No daily discharge
28-11-2020	0	0	
29-11-2020	0	0	
30-11-2020	0	0	
01-12-2020	0	0	
02-12-2020	0	0	
03-12-2020	0	0	
04-12-2020	0	0	
05-12-2020	0	0	
06-12-2020	0	0	
07-12-2020	0	0	
08-12-2020	0	0	
09-12-2020	0	0	
10-12-2020	0	0	
11-12-2020	0	0	
12-12-2020	0	0	
13-12-2020	0	0	
14-12-2020	0	0	
15-12-2020	0	0	
16-12-2020	0	0	
17-12-2020	0	0	
18-12-2020	0	0	
19-12-2020	5	0	
20-12-2020	0	0	
21-12-2020	0	5	
22-12-2020	0	0	
23-12-2020	5	0	
24-12-2020	0	5	
25-12-2020	0	0	
26-12-2020	0	0	
27-12-2020	0	0	

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
28-12-2020	0	0	
29-12-2020	0	0	
30-12-2020	0	0	
31-12-2020	0	0	
01-01-2021	0	0	
02-01-2021	0	0	
03-01-2021	0	0	
04-01-2021	0	0	
05-01-2021	0	0	
06-01-2021	0	0	
07-01-2021	0	0	
08-01-2021	0	0	
09-01-2021	0	0	
10-01-2021	0	0	
11-01-2021	0	0	
12-01-2021	0	0	
13-01-2021	0	0	
14-01-2021	3.05	1.1	
15-01-2021	5.31	3.9	
16-01-2021	3.17	2.32	
17-01-2021	0	0	
18-01-2021	0	0	
19-01-2021	0	0	
20-01-2021	3	0	
21-01-2021	0	0	
22-01-2021	0	0	
23-01-2021	0	0	
24-01-2021	0	0	
25-01-2021	0	0	
26-01-2021	0	0	
27-01-2021	0	0	
28-01-2021	1	0	
29-01-2021	0	0	
30-01-2021	0	0	
31-01-2021	0	0	
01-02-2021	0	0	
02-02-2021	0	0	
03-02-2021	0	0	
04-02-2021	0	0	
05-02-2021	0	0	
06-02-2021	0	0	
07-02-2021	0	0	
08-02-2021	0	0	
09-02-2021	0	0	
10-02-2021	0	0	
11-02-2021	0	0	

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
12-02-2021	0	0	
13-02-2021	0	0	
14-02-2021	0	0	
15-02-2021	0	0	
16-02-2021	0	0	
17-02-2021	0	0	
18-02-2021	0	0	
19-02-2021	0	0	
20-02-2021	0	0	
21-02-2021	0	0	
22-02-2021	0	0	
23-02-2021	0	0	
24-02-2021	0	0	
25-02-2021	0	0	
26-02-2021	0	0	
27-02-2021	0	0	
28-02-2021	0	0	
01-03-2021	0	0	
02-03-2021	0	0	
03-03-2021	0	0	
04-03-2021	0	0	
05-03-2021	0	0	
06-03-2021	0	0	
07-03-2021	NR	0	No daily discharge
08-03-2021	0	0	
09-03-2021	0	0	
10-03-2021	0	0	
11-03-2021	0	0	
12-03-2021	0	0	
13-03-2021	0	0	
14-03-2021	0	0	
15-03-2021	0	0	
16-03-2021	0	0	
17-03-2021	0	0	
18-03-2021	0	0	
19-03-2021	0	0	
20-03-2021	0	0	
21-03-2021	0	0	
22-03-2021	0	0	
23-03-2021	0	0	
24-03-2021	0	0	
25-03-2021	0	0	
26-03-2021	0	0	
27-03-2021	0	0	
28-03-2021	0	0	
29-03-2021	0	0	

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
30-03-2021	0	0	
31-03-2021	0	0	
02-04-2021	0	0	
03-04-2021	0	0	
04-04-2021	0	0	
05-04-2021	0	0	
06-04-2021	0	0	
07-04-2021	0	0	
08-04-2021	0	0	
09-04-2021	0	0	
10-04-2021	0	0	
11-04-2021	0	0	
12-04-2021	0	0	
13-04-2021	0	0	
14-04-2021	0	0	
15-04-2021	0	0	
16-04-2021	0	0	
17-04-2021	0	0	
18-04-2021	0	0	
19-04-2021	0	0	
20-04-2021	0	0	
21-04-2021	0	0	
22-04-2021	0	0	
23-04-2021	0	0	
24-04-2021	0	0	
25-04-2021	0	0	
26-04-2021	0	0	
27-04-2021	0	0	
28-04-2021	0	0	
29-04-2021	0	0	
30-04-2021	0	0	
01-05-2021	0	0	
02-05-2021	0	0	
03-05-2021	0	0	
04-05-2021	0	0	
05-05-2021	0	0	
06-05-2021	0	0	
07-05-2021	0	0	
08-05-2021	0	0	
09-05-2021	0	0	
10-05-2021	0	0	
11-05-2021	0	0	
12-05-2021	0	0	
13-05-2021	0	0	
14-05-2021	0	0	
15-05-2021	0	0	

Date	WAD Cyanide		Comments (NR= No result)
	Process Water Dam (mg/L)	TSF (mg/L)	
16-05-2021	0	0	
17-05-2021	0	0	
18-05-2021	0	0	
19-05-2021	0	0	
20-05-2021	0	0	
21-05-2021	0	0	
22-05-2021	0	0	
23-05-2021	0	0	
24-05-2021	0	0	
25-05-2021	0	0	
26-05-2021	0	0	
27-05-2021	0	0	
28-05-2021	0	0	
29-05-2021	0	0	
30-05-2021	0	0	
31-05-2021	0	0	
01-06-2021	0	0	
02-06-2021	0	0	
03-06-2021	0	0	
04-06-2021	0	0	
05-06-2021	0	0	
06-06-2021	0	0	
07-06-2021	0	0	
08-06-2021	0	0	
09-06-2021	0	0	
10-06-2021	0	0	
11-06-2021	0	0	
12-06-2021	0	0	
13-06-2021	0	0	
14-06-2021	0	0	
15-06-2021	0	0	
16-06-2021	0	0	
17-06-2021	0	0	
18-06-2021	0	0	
19-06-2021	0	0	
20-06-2021	0	0	
21-06-2021	0	0	
22-06-2021	0	0	
23-06-2021	0	0	
24-06-2021	0	0	
25-06-2021	0	0	
26-06-2021	0	14	
27-06-2021	0	7	
28-06-2021	0	9	
29-06-2021	0	9	
30-06-2021	2	0	

Appendix B Blast Monitoring Summary

Date	Time	Day of Week	Time Period	Compliance		Histograms	
				Vibration	Air Blast	Harris Residence	
				mm/s	dB(L)	mm/s	dB(L)
02-07-2020	12:54:16	Thursday	DAY	5.00	115.0	0.17	78.6
03-07-2020	12:34:00	Friday	DAY	5.00	115.0	0.09	80.8
03-07-2020	22:15:10	Friday	NIGHT	1.00	115.0	0.19	75.6
03-07-2020	22:15:10	Friday	NIGHT	1.00	115.0	0.19	75.6
04-07-2020	18:16:25	Saturday	EVENING	2.00	115.0	0.06	74.8
05-07-2020	11:24:27	Sunday	Sunday	1.00	115.0	0.41	83.2
06-07-2020	13:35:55	Monday	DAY	5.00	115.0	0.08	80.8
06-07-2020	13:49:15	Monday	DAY	5.00	115.0	0.08	85.8
07-07-2020	13:49:28	Tuesday	DAY	5.00	115.0	0.45	85.8
08-07-2020	14:26:40	Wednesday	DAY	5.00	115.0	0.14	74.8
10-07-2020	15:20:06	Friday	DAY	5.00	115.0	0.49	78.1
12-07-2020	18:16:37	Sunday	Sunday	1.00	115.0	0.22	75.6
13-07-2020	14:25:00	Monday	DAY	5.00	115.0	0.05	88.9
13-07-2020	19:30:00	Monday	EVENING	2.00	115.0	0.08	81.2
14-07-2020	13:28:33	Tuesday	DAY	5.00	115.0	0.24	75.6
14-07-2020	13:28:33	Tuesday	DAY	5.00	115.0	0.24	75.6
18-07-2020	14:35:00	Saturday	DAY	5.00	115.0	0.15	79.6
18-07-2020	14:35:07	Saturday	DAY	5.00	115.0	0.32	79.6
20-07-2020	13:46:57	Monday	DAY	5.00	115.0	0.06	88.0
21-07-2020	12:45:00	Tuesday	DAY	5.00	115.0	0.06	78.1
22-07-2020	06:03:35	Wednesday	NIGHT	1.00	115.0	0.31	75.6
22-07-2020	14:10:50	Wednesday	DAY	5.00	115.0	0.36	78.6
22-07-2020	14:11:01	Wednesday	DAY	5.00	115.0	0.36	80.0
23-07-2020	12:38:20	Thursday	DAY	5.00	115.0	0.10	75.6
23-07-2020	12:43:25	Thursday	DAY	5.00	115.0	0.11	80.8
23-07-2020	12:53:09	Thursday	DAY	5.00	115.0	0.35	79.6
24-07-2020	12:13:40	Friday	DAY	5.00	115.0	0.12	74.8
24-07-2020	17:40:00	Friday	DAY	5.00	115.0	0.19	79.6
25-07-2020	15:32:53	Saturday	DAY	5.00	115.0	0.45	95.5
26-07-2020	13:01:03	Sunday	Sunday	1.00	115.0	0.50	85.8
28-07-2020	12:37:30	Tuesday	DAY	5.00	115.0	0.08	89.1
28-07-2020	12:37:30	Tuesday	DAY	5.00	115.0	0.08	89.1
29-07-2020	17:55:15	Wednesday	DAY	5.00	115.0	0.13	74.8
29-07-2020	17:55:25	Wednesday	DAY	5.00	115.0	0.13	74.8
29-07-2020	17:55:25	Wednesday	DAY	5.00	115.0	0.13	74.8
30-07-2020	13:28:05	Thursday	DAY	5.00	115.0	0.46	82.9
30-07-2020	18:25:00	Thursday	EVENING	2.00	115.0	0.11	74.8
31-07-2020	17:59:40	Friday	DAY	5.00	115.0	0.16	74.8
31-07-2020	17:59:40	Friday	DAY	5.00	115.0	0.16	74.8
02-08-2020	17:59:51	Sunday	Sunday	1.00	115.0	0.65	78.1
03-08-2020	13:33:10	Monday	DAY	5.00	115.0	0.18	81.2

04-08-2020	14:18:24	Tuesday	DAY	5.00	115.0	0.11	87.4
05-08-2020	00:23:05	Wednesday	NIGHT	1.00	115.0	0.20	74.8
05-08-2020	18:57:00	Wednesday	EVENING	2.00	115.0	0.06	74.8
06-08-2020	17:56:10	Thursday	DAY	5.00	115.0	0.06	78.1
07-08-2020	20:36:49	Friday	EVENING	2.00	115.0	0.15	74.8
09-08-2020	18:56:10	Sunday	Sunday	1.00	115.0	0.09	73.1
10-08-2020	13:05:18	Monday	DAY	5.00	115.0	0.14	91.0
11-08-2020	12:26:00	Tuesday	DAY	5.00	115.0	1.01	87.0
13-08-2020	18:30:41	Thursday	EVENING	2.00	115.0	0.21	75.6
14-08-2020	22:32:07	Friday	NIGHT	1.00	115.0	0.25	75.6
15-08-2020	19:07:00	Saturday	EVENING	2.00	115.0	0.15	88.5
15-08-2020	19:07:00	Saturday	EVENING	2.00	115.0	0.15	88.5
16-08-2020	00:24:00	Sunday	Sunday	1.00	115.0	0.08	73.1
16-08-2020	21:50:00	Sunday	Sunday	1.00	115.0	0.07	74.8
17-08-2020	01:57:00	Monday	NIGHT	1.00	115.0	0.13	74.8
17-08-2020	17:00:00	Monday	DAY	5.00	115.0	0.15	75.6
18-08-2020	15:31:21	Tuesday	DAY	5.00	115.0	0.22	91.0
20-08-2020	13:13:10	Thursday	DAY	5.00	115.0	0.08	82.9
21-08-2020	15:05:16	Friday	DAY	5.00	115.0	0.25	88.9
21-08-2020	15:05:16	Friday	DAY	5.00	115.0	0.25	88.9
22-08-2020	18:00:10	Saturday	EVENING	2.00	115.0	0.19	78.1
24-08-2020	14:11:21	Monday	DAY	5.00	115.0	0.28	80.0
26-08-2020	06:03:30	Wednesday	NIGHT	1.00	115.0	0.45	75.6
26-08-2020	12:15:53	Wednesday	DAY	5.00	115.0	0.25	75.6
26-08-2020	12:16:00	Wednesday	DAY	5.00	115.0	0.25	75.6
27-08-2020	13:54:18	Thursday	DAY	5.00	115.0	0.41	79.6
28-08-2020	12:41:00	Friday	DAY	5.00	115.0	0.11	94.8
28-08-2020	12:41:30	Friday	DAY	5.00	115.0	0.12	88.1
30-08-2020	18:15:10	Sunday	Sunday	1.00	115.0	0.27	73.1
31-08-2020	12:00:10	Monday	DAY	5.00	115.0	0.17	90.6
31-08-2020	12:03:15	Monday	DAY	5.00	115.0	0.09	92.6
01-09-2020	16:34:45	Tuesday	DAY	5.00	115.0	0.24	79.6
01-09-2020	16:34:55	Tuesday	DAY	5.00	115.0	0.23	76.9
01-09-2020	23:15:45	Tuesday	NIGHT	1.00	115.0	0.12	74.8
02-09-2020	15:09:30	Wednesday	DAY	5.00	115.0	0.32	89.8
03-09-2020	01:17:00	Thursday	NIGHT	1.00	115.0	0.17	74.8
03-09-2020	12:20:45	Thursday	DAY	5.00	115.0	0.49	102.9
04-09-2020	13:24:20	Friday	DAY	5.00	115.0	0.22	73.1
04-09-2020	18:27:45	Friday	EVENING	2.00	115.0	0.21	74.8
04-09-2020	18:50:00	Friday	EVENING	2.00	115.0	0.19	74.8
05-09-2020	19:04:45	Saturday	EVENING	2.00	115.0	0.17	75.6
06-09-2020	10:51:38	Sunday	Sunday	1.00	115.0	0.42	84.3
08-09-2020	18:57:35	Tuesday	EVENING	2.00	115.0	0.32	73.1
09-09-2020	06:13:00	Wednesday	NIGHT	1.00	115.0	0.13	73.1
10-09-2020	13:53:14	Thursday	DAY	5.00	115.0	0.47	87.6
10-09-2020	13:53:14	Thursday	DAY	5.00	115.0	0.47	87.6
10-09-2020	18:55:00	Thursday	EVENING	2.00	115.0	0.17	74.8
11-09-2020	01:35:00	Friday	NIGHT	1.00	115.0	0.06	75.6
13-09-2020	18:52:39	Sunday	Sunday	1.00	115.0	0.40	76.9

14-09-2020	14:35:00	Monday	DAY	5.00	115.0	0.23	89.7
14-09-2020	14:35:00	Monday	DAY	5.00	115.0	0.23	89.7
14-09-2020	14:35:00	Monday	DAY	5.00	115.0	0.23	89.7
15-09-2020	14:02:22	Tuesday	DAY	5.00	115.0	0.47	78.6
16-09-2020	01:35:00	Wednesday	NIGHT	1.00	115.0	0.10	75.6
17-09-2020	00:04:00	Thursday	NIGHT	1.00	115.0	0.10	74.8
17-09-2020	14:40:15	Thursday	DAY	5.00	115.0	0.39	75.6
17-09-2020	23:10:00	Thursday	NIGHT	1.00	115.0	0.26	76.9
19-09-2020	06:45:00	Saturday	NIGHT	1.00	115.0	0.12	80.0
20-09-2020	01:30:00	Sunday	Sunday	1.00	115.0	0.11	89.1
20-09-2020	01:30:00	Sunday	Sunday	1.00	115.0	0.11	89.1
21-09-2020	07:00:33	Monday	DAY	5.00	115.0	0.40	80.0
21-09-2020	07:00:33	Monday	DAY	5.00	115.0	0.40	80.0
21-09-2020	13:22:10	Monday	DAY	5.00	115.0	0.34	91.0
22-09-2020	14:00:00	Tuesday	DAY	5.00	115.0	0.22	87.6
23-09-2020	02:10:00	Wednesday	NIGHT	1.00	115.0	0.08	74.8
23-09-2020	18:55:45	Wednesday	EVENING	2.00	115.0	0.14	73.1
23-09-2020	18:55:45	Wednesday	EVENING	2.00	115.0	0.14	73.1
24-09-2020	03:30:00	Thursday	NIGHT	1.00	115.0	0.08	75.6
24-09-2020	03:30:00	Thursday	NIGHT	1.00	115.0	0.08	75.6
24-09-2020	20:32:30	Thursday	EVENING	2.00	115.0	0.09	73.1
24-09-2020	20:32:30	Thursday	EVENING	2.00	115.0	0.09	73.1
25-09-2020	06:46:20	Friday	NIGHT	1.00	115.0	0.06	83.2
26-09-2020	22:03:35	Saturday	NIGHT	1.00	115.0	0.15	74.8
27-09-2020	06:43:18	Sunday	Sunday	1.00	115.0	0.22	75.6
27-09-2020	06:43:18	Sunday	Sunday	1.00	115.0	0.22	75.6
28-09-2020	06:51:35	Monday	NIGHT	1.00	115.0	0.19	75.6
28-09-2020	07:09:05	Monday	DAY	5.00	115.0	0.79	93.6
28-09-2020	12:30:00	Monday	DAY	5.00	115.0	0.15	81.9
28-09-2020	18:58:52	Monday	EVENING	2.00	115.0	0.17	74.8
29-09-2020	03:59:40	Tuesday	NIGHT	1.00	115.0	0.16	75.6
29-09-2020	06:34:45	Tuesday	NIGHT	1.00	115.0	0.18	74.8
29-09-2020	23:04:31	Tuesday	NIGHT	1.00	115.0	0.16	74.8
30-09-2020	14:44:00	Wednesday	DAY	5.00	115.0	0.71	83.2
30-09-2020	18:50:00	Wednesday	EVENING	2.00	115.0	0.26	80.0
01-10-2020	06:50:00	Thursday	NIGHT	1.00	115.0	0.06	74.8
02-10-2020	19:18:45	Friday	EVENING	2.00	115.0	0.31	74.8
04-10-2020	19:14:10	Sunday	Sunday	1.00	115.0		
04-10-2020	19:14:10	Sunday	Sunday	1.00	115.0		
05-10-2020	19:12:00	Monday	P.Holiday	1.00	115.0		
06-10-2020	06:56:25	Tuesday	NIGHT	1.00	115.0		
06-10-2020	07:07:50	Tuesday	DAY	5.00	115.0		
07-10-2020	06:45:45	Wednesday	NIGHT	1.00	115.0	0.14	74.8
07-10-2020	06:51:05	Wednesday	NIGHT	1.00	115.0	0.14	74.8
08-10-2020	06:50:20	Thursday	NIGHT	1.00	115.0	0.16	76.9
08-10-2020	06:50:25	Thursday	NIGHT	1.00	115.0	0.16	81.2
08-10-2020	06:51:20	Thursday	NIGHT	1.00	115.0	0.16	83.2
08-10-2020	06:51:30	Thursday	NIGHT	1.00	115.0	0.16	80.8
09-10-2020	00:35:00	Friday	NIGHT	1.00	115.0	0.09	74.8

11-10-2020	13:03:30	Sunday	Sunday	1.00	115.0	0.33	84.6
11-10-2020	21:07:45	Sunday	Sunday	1.00	115.0	0.27	73.1
12-10-2020	01:32:30	Monday	NIGHT	1.00	115.0	0.14	74.8
12-10-2020	14:49:25	Monday	DAY	5.00	115.0	0.36	74.8
12-10-2020	15:28:30	Monday	DAY	5.00	115.0	0.36	74.8
12-10-2020	15:28:32	Monday	DAY	5.00	115.0	0.36	74.8
12-10-2020	19:45:10	Monday	EVENING	2.00	115.0	0.34	73.1
13-10-2020	14:14:45	Tuesday	DAY	5.00	115.0	0.38	82.3
14-10-2020	18:59:46	Wednesday	EVENING	2.00	115.0	0.40	73.1
15-10-2020	01:56:30	Thursday	NIGHT	1.00	115.0	0.23	73.1
15-10-2020	06:44:30	Thursday	NIGHT	1.00	115.0	0.12	73.1
15-10-2020	19:18:22	Thursday	EVENING	2.00	115.0	0.40	75.6
17-10-2020	13:10:31	Saturday	DAY	5.00	115.0	0.51	79.6
17-10-2020	18:48:15	Saturday	EVENING	2.00	115.0	0.27	93.1
18-10-2020	06:45:00	Sunday	Sunday	1.00	115.0	0.15	73.1
19-10-2020	18:28:15	Monday	EVENING	2.00	115.0	0.29	83.2
20-10-2020	06:40:10	Tuesday	NIGHT	1.00	115.0	0.11	74.8
20-10-2020	18:47:15	Tuesday	EVENING	2.00	115.0	0.39	74.8
21-10-2020	18:41:02	Wednesday	EVENING	2.00	115.0	0.51	73.1
21-10-2020	18:41:02	Wednesday	EVENING	2.00	115.0	0.51	73.1
22-10-2020	13:22:24	Thursday	DAY	5.00	115.0	0.46	75.6
22-10-2020	13:22:24	Thursday	DAY	5.00	115.0	0.46	75.6
22-10-2020	13:22:24	Thursday	DAY	5.00	115.0	0.46	75.6
22-10-2020	18:44:02	Thursday	EVENING	2.00	115.0	0.41	76.9
23-10-2020	06:38:00	Friday	NIGHT	1.00	115.0	0.23	73.1
23-10-2020	18:59:50	Friday	EVENING	2.00	115.0	0.56	73.1
23-10-2020	19:19:30	Friday	EVENING	2.00	115.0	0.34	73.1
23-10-2020	19:19:35	Friday	EVENING	2.00	115.0	0.34	73.1
24-10-2020	19:03:00	Saturday	EVENING	2.00	115.0	0.24	105.2
25-10-2020	13:38:00	Sunday	Sunday	1.00	115.0	0.15	87.4
25-10-2020	13:38:00	Sunday	Sunday	1.00	115.0	0.15	87.4
25-10-2020	18:55:10	Sunday	Sunday	1.00	115.0	0.20	83.8
26-10-2020	06:43:30	Monday	NIGHT	1.00	115.0	0.09	74.8
26-10-2020	14:00:42	Monday	DAY	5.00	115.0	0.47	84.3
26-10-2020	14:00:42	Monday	DAY	5.00	115.0	0.47	84.3
27-10-2020	06:43:25	Tuesday	NIGHT	1.00	115.0	0.08	74.8
27-10-2020	18:35:45	Tuesday	EVENING	2.00	115.0	0.31	74.8
27-10-2020	18:35:45	Tuesday	EVENING	2.00	115.0	0.31	74.8
27-10-2020	18:35:45	Tuesday	EVENING	2.00	115.0	0.31	74.8
27-10-2020	18:45:00	Tuesday	EVENING	2.00	115.0	0.31	76.9
28-10-2020	06:37:15	Wednesday	NIGHT	1.00	115.0	0.09	81.9
28-10-2020	18:40:30	Wednesday	EVENING	2.00	115.0	0.31	79.6
29-10-2020	06:35:55	Thursday	NIGHT	1.00	115.0	0.06	74.8
29-10-2020	06:46:40	Thursday	NIGHT	1.00	115.0	0.09	98.3
30-10-2020	06:39:00	Friday	NIGHT	1.00	115.0	0.14	74.8
30-10-2020	06:39:10	Friday	NIGHT	1.00	115.0	0.14	80.8
31-10-2020	06:57:30	Saturday	NIGHT	1.00	115.0	0.07	73.1
31-10-2020	06:57:30	Saturday	NIGHT	1.00	115.0	0.07	73.1
31-10-2020	18:57:49	Saturday	EVENING	2.00	115.0	0.42	89.7

31-10-2020	19:16:40	Saturday	EVENING	2.00	115.0	0.26	90.5
01-11-2020	06:37:40	Sunday	Sunday	1.00	115.0	0.08	74.8
01-11-2020	18:50:00	Sunday	Sunday	1.00	115.0	0.32	87.4
02-11-2020	06:30:50	Monday	NIGHT	1.00	115.0	0.14	74.8
02-11-2020	06:32:50	Monday	NIGHT	1.00	115.0	0.14	74.8
02-11-2020	12:33:56	Monday	DAY	5.00	115.0	0.45	76.9
04-11-2020	08:26:30	Wednesday	DAY	5.00	115.0	0.17	83.8
05-11-2020	06:46:30	Thursday	NIGHT	1.00	115.0	0.13	98.7
05-11-2020	12:35:00	Thursday	DAY	5.00	115.0	0.17	101.8
05-11-2020	12:36:30	Thursday	DAY	5.00	115.0	0.17	106.5
06-11-2020	19:02:49	Friday	EVENING	2.00	115.0	0.28	91.2
06-11-2020	19:02:58	Friday	EVENING	2.00	115.0	0.27	91.2
08-11-2020	18:40:40	Sunday	Sunday	1.00	115.0	0.39	75.6
09-11-2020	18:58:38	Monday	EVENING	2.00	115.0	0.60	80.0
10-11-2020	19:45:10	Tuesday	EVENING	2.00	115.0	0.42	73.1
10-11-2020	19:45:10	Tuesday	EVENING	2.00	115.0	0.42	73.1
12-11-2020	03:59:30	Thursday	NIGHT	1.00	115.0	0.26	73.1
12-11-2020	13:16:40	Thursday	DAY	5.00	115.0	0.60	84.3
13-11-2020	06:33:45	Friday	NIGHT	1.00	115.0	0.13	74.8
14-11-2020	02:45:00	Saturday	NIGHT	1.00	115.0	0.14	74.8
14-11-2020	18:45:00	Saturday	EVENING	2.00	115.0	0.39	85.3
15-11-2020	02:30:00	Sunday	Sunday	1.00	115.0	0.15	74.8
15-11-2020	06:54:30	Sunday	Sunday	1.00	115.0	0.08	73.1
15-11-2020	06:57:10	Sunday	Sunday	1.00	115.0	0.08	73.1
15-11-2020	15:00:28	Sunday	Sunday	1.00	115.0	0.63	85.1
16-11-2020	06:58:30	Monday	NIGHT	1.00	115.0	0.31	73.1
16-11-2020	06:58:30	Monday	NIGHT	1.00	115.0	0.31	73.1
16-11-2020	18:42:35	Monday	EVENING	2.00	115.0	0.31	85.3
17-11-2020	06:34:25	Tuesday	NIGHT	1.00	115.0	0.14	76.9
17-11-2020	06:44:58	Tuesday	NIGHT	1.00	115.0	0.13	74.8
17-11-2020	18:46:45	Tuesday	EVENING	2.00	115.0	0.35	83.2
17-11-2020	18:46:45	Tuesday	EVENING	2.00	115.0	0.35	83.2
18-11-2020	18:50:52	Wednesday	EVENING	2.00	115.0	0.64	76.9
18-11-2020	19:28:30	Wednesday	EVENING	2.00	115.0	0.47	74.8
19-11-2020	06:55:00	Thursday	NIGHT	1.00	115.0	0.22	75.6
19-11-2020	18:40:00	Thursday	EVENING	2.00	115.0	0.55	74.8
19-11-2020	18:40:00	Thursday	EVENING	2.00	115.0	0.55	74.8
20-11-2020	11:31:25	Friday	DAY	5.00	115.0	0.47	83.2
20-11-2020	18:44:48	Friday	EVENING	2.00	115.0	0.57	79.6
20-11-2020	18:44:48	Friday	EVENING	2.00	115.0	0.57	79.6
21-11-2020	07:00:00	Saturday	DAY	5.00	115.0	0.18	74.8
21-11-2020	18:46:25	Saturday	EVENING	2.00	115.0	0.50	73.1
22-11-2020	06:51:00	Sunday	Sunday	1.00	115.0	0.35	87.0
22-11-2020	13:26:30	Sunday	Sunday	1.00	115.0	0.41	86.6
22-11-2020	13:26:40	Sunday	Sunday	1.00	115.0	0.42	79.6
23-11-2020	06:42:16	Monday	NIGHT	1.00	115.0	0.53	78.1
23-11-2020	06:42:16	Monday	NIGHT	1.00	115.0	0.53	78.1
23-11-2020	18:45:40	Monday	EVENING	2.00	115.0	0.32	87.4
24-11-2020	06:36:30	Tuesday	NIGHT	1.00	115.0	0.17	82.9

24-11-2020	18:41:00	Tuesday	EVENING	2.00	115.0	0.37	79.6
25-11-2020	06:45:00	Wednesday	NIGHT	1.00	115.0	0.10	75.6
27-11-2020	11:58:45	Friday	DAY	5.00	115.0	0.72	85.8
27-11-2020	11:58:45	Friday	DAY	5.00	115.0	0.72	85.8
27-11-2020	19:04:00	Friday	EVENING	2.00	115.0	0.57	74.8
27-11-2020	20:00:26	Friday	EVENING	2.00	115.0	0.66	74.8
28-11-2020	06:32:38	Saturday	NIGHT	1.00	115.0	0.38	78.1
28-11-2020	06:32:38	Saturday	NIGHT	1.00	115.0	0.38	78.1
28-11-2020	15:39:00	Saturday	DAY	5.00	115.0	0.57	90.5
29-11-2020	06:41:15	Sunday	Sunday	1.00	115.0	0.35	80.8
29-11-2020	18:46:00	Sunday	Sunday	1.00	115.0	0.35	85.1
30-11-2020	18:55:00	Monday	EVENING	2.00	115.0	0.53	81.9
01-12-2020	06:48:41	Tuesday	NIGHT	1.00	115.0	0.24	74.8
01-12-2020	06:48:41	Tuesday	NIGHT	1.00	115.0	0.24	74.8
03-12-2020	01:47:15	Thursday	NIGHT	1.00	115.0	0.19	74.8
03-12-2020	06:41:19	Thursday	NIGHT	1.00	115.0	0.20	76.9
03-12-2020	13:03:10	Thursday	DAY	5.00	115.0	0.49	78.6
04-12-2020	14:28:45	Friday	DAY	5.00	115.0	0.44	96.6
05-12-2020	15:08:19	Saturday	DAY	5.00	115.0	0.40	99.7
07-12-2020	06:31:45	Monday	NIGHT	1.00	115.0	0.10	74.8
07-12-2020	19:09:40	Monday	EVENING	2.00	115.0	0.31	97.7
07-12-2020	19:09:40	Monday	EVENING	2.00	115.0	0.31	97.7
07-12-2020	19:09:40	Monday	EVENING	2.00	115.0	0.31	97.7
08-12-2020	06:33:20	Tuesday	NIGHT	1.00	115.0	0.07	76.9
10-12-2020	06:50:00	Thursday	NIGHT	1.00	115.0	0.10	74.8
10-12-2020	18:52:47	Thursday	EVENING	2.00	115.0	0.41	78.6
10-12-2020	18:52:50	Thursday	EVENING	2.00	115.0	0.41	78.6
10-12-2020	18:52:50	Thursday	EVENING	2.00	115.0	0.41	78.6
12-12-2020	06:53:00	Saturday	NIGHT	1.00	115.0	0.15	74.8
12-12-2020	07:13:50	Saturday	DAY	5.00	115.0	0.16	85.8
13-12-2020	19:01:03	Sunday	Sunday	1.00	115.0	0.42	79.6
15-12-2020	18:35:40	Tuesday	EVENING	2.00	115.0	0.44	84.6
16-12-2020	06:36:25	Wednesday	NIGHT	1.00	115.0	0.21	74.8
16-12-2020	06:40:55	Wednesday	NIGHT	1.00	115.0	0.23	73.1
18-12-2020	13:50:00	Friday	DAY	5.00	115.0	0.29	78.6
18-12-2020	13:50:00	Friday	DAY	5.00	115.0	0.29	78.6
18-12-2020	18:45:50	Friday	EVENING	2.00	115.0	0.36	89.1
19-12-2020	07:00:00	Saturday	DAY	5.00	115.0	0.10	73.1
20-12-2020	06:57:00	Sunday	Sunday	1.00	115.0	0.17	74.8
20-12-2020	06:59:10	Sunday	Sunday	1.00	115.0	0.47	78.1
21-12-2020	13:42:15	Monday	DAY	5.00	115.0	0.18	83.8
22-12-2020	06:57:20	Tuesday	NIGHT	1.00	115.0	0.14	76.9
22-12-2020	18:23:30	Tuesday	EVENING	2.00	115.0	0.25	95.6
22-12-2020	18:31:15	Tuesday	EVENING	2.00	115.0	0.25	97.7
23-12-2020	18:42:40	Wednesday	EVENING	2.00	115.0	0.32	80.0
24-12-2020	06:46:50	Thursday	NIGHT	1.00	115.0	0.14	75.6
24-12-2020	11:38:20	Thursday	DAY	5.00	115.0	0.38	88.0
25-12-2020	04:20:00	Friday	P.Holiday	1.00	115.0	0.17	75.6
25-12-2020	18:58:35	Friday	P.Holiday	1.00	115.0	0.42	74.8

26-12-2020	17:15:02	Saturday	P.Holiday	1.00	115.0	0.65	80.0
27-12-2020	06:45:34	Sunday	Sunday	1.00	115.0	0.12	75.6
27-12-2020	06:45:45	Sunday	Sunday	1.00	115.0	0.13	74.8
28-12-2020	06:36:20	Monday	P.Holiday	1.00	115.0	0.28	73.1
28-12-2020	06:36:20	Monday	P.Holiday	1.00	115.0	0.28	73.1
28-12-2020	18:50:00	Monday	P.Holiday	1.00	115.0	0.45	98.1
29-12-2020	06:44:10	Tuesday	NIGHT	1.00	115.0	0.12	79.6
30-12-2020	01:30:00	Wednesday	NIGHT	1.00	115.0	0.17	75.6
30-12-2020	06:28:15	Wednesday	NIGHT	1.00	115.0	0.11	78.6
30-12-2020	19:59:25	Wednesday	EVENING	2.00	115.0	0.43	74.8
31-12-2020	18:53:30	Thursday	EVENING	2.00	115.0	0.44	99.8
02-01-2021	06:53:45	Saturday	NIGHT	1.00	115.0	0.20	75.6
02-01-2021	18:55:10	Saturday	EVENING	2.00	115.0	0.29	90.2
03-01-2021	18:45:00	Sunday	Sunday	1.00	115.0	0.37	81.2
04-01-2021	06:41:20	Monday	NIGHT	1.00	115.0	0.25	99.1
04-01-2021	18:49:50	Monday	EVENING	2.00	115.0	0.33	80.8
05-01-2021	03:54:30	Tuesday	NIGHT	1.00	115.0	0.16	74.8
05-01-2021	03:54:30	Tuesday	NIGHT	1.00	115.0	0.16	74.8
05-01-2021	03:54:30	Tuesday	NIGHT	1.00	115.0	0.16	74.8
05-01-2021	18:45:00	Tuesday	EVENING	2.00	115.0	0.37	74.8
05-01-2021	18:45:00	Tuesday	EVENING	2.00	115.0	0.37	74.8
06-01-2021	04:15:00	Wednesday	NIGHT	1.00	115.0	0.19	74.8
07-01-2021	06:51:15	Thursday	NIGHT	1.00	115.0	0.21	79.6
07-01-2021	10:36:35	Thursday	DAY	5.00	115.0	0.27	81.9
07-01-2021	20:00:30	Thursday	EVENING	2.00	115.0	0.43	78.6
08-01-2021	06:40:00	Friday	NIGHT	1.00	115.0	0.17	74.8
09-01-2021	06:35:48	Saturday	NIGHT	1.00	115.0	0.15	73.1
09-01-2021	06:45:00	Saturday	NIGHT	1.00	115.0	0.15	81.9
09-01-2021	06:45:20	Saturday	NIGHT	1.00	115.0	0.15	78.6
09-01-2021	18:30:00	Saturday	EVENING	2.00	115.0	0.41	80.0
10-01-2021	06:49:47	Sunday	Sunday	1.00	115.0	0.18	75.6
10-01-2021	06:49:47	Sunday	Sunday	1.00	115.0	0.18	75.6
10-01-2021	18:45:00	Sunday	Sunday	1.00	115.0	0.45	80.0
11-01-2021	07:01:57	Monday	DAY	5.00	115.0	0.15	75.6
11-01-2021	18:50:48	Monday	EVENING	2.00	115.0	0.61	75.6
11-01-2021	18:50:48	Monday	EVENING	2.00	115.0	0.61	75.6
12-01-2021	06:47:20	Tuesday	NIGHT	1.00	115.0	0.25	74.8
13-01-2021	06:33:20	Wednesday	NIGHT	1.00	115.0	0.27	74.8
13-01-2021	06:48:20	Wednesday	NIGHT	1.00	115.0	0.27	73.1
13-01-2021	06:59:42	Wednesday	NIGHT	1.00	115.0	0.28	75.6
14-01-2021	18:56:35	Thursday	EVENING	2.00	115.0	0.49	81.2
14-01-2021	19:10:00	Thursday	EVENING	2.00	115.0	0.48	92.9
15-01-2021	06:57:03	Friday	NIGHT	1.00	115.0	0.44	78.1
15-01-2021	18:52:10	Friday	EVENING	2.00	115.0	0.36	95.4
15-01-2021	18:58:35	Friday	EVENING	2.00	115.0	0.36	95.5
16-01-2021	06:55:41	Saturday	NIGHT	1.00	115.0	0.35	79.6
16-01-2021	06:55:41	Saturday	NIGHT	1.00	115.0	0.35	79.6
16-01-2021	19:01:10	Saturday	EVENING	2.00	115.0	0.31	87.6
16-01-2021	21:04:15	Saturday	EVENING	2.00	115.0	0.28	74.8

17-01-2021	18:55:05	Sunday	Sunday	1.00	115.0	0.36	91.4
18-01-2021	06:48:40	Monday	NIGHT	1.00	115.0	0.09	74.8
18-01-2021	06:48:40	Monday	NIGHT	1.00	115.0	0.09	74.8
18-01-2021	06:53:00	Monday	NIGHT	1.00	115.0	0.09	75.6
19-01-2021	06:47:10	Tuesday	NIGHT	1.00	115.0	0.10	74.8
20-01-2021	07:04:29	Wednesday	DAY	5.00	115.0	0.27	74.8
20-01-2021	07:04:29	Wednesday	DAY	5.00	115.0	0.27	74.8
20-01-2021	07:04:29	Wednesday	DAY	5.00	115.0	0.27	74.8
20-01-2021	18:50:30	Wednesday	EVENING	2.00	115.0	0.47	79.6
21-01-2021	06:54:45	Thursday	NIGHT	1.00	115.0	0.21	80.0
22-01-2021	00:45:00	Friday	NIGHT	1.00	115.0	0.30	75.6
22-01-2021	19:03:00	Friday	EVENING	2.00	115.0	0.51	87.4
23-01-2021	06:36:30	Saturday	NIGHT	1.00	115.0	0.27	73.1
24-01-2021	06:42:10	Sunday	Sunday	1.00	115.0	0.31	73.1
24-01-2021	18:49:35	Sunday	Sunday	1.00	115.0	0.56	80.8
25-01-2021	06:39:05	Monday	NIGHT	1.00	115.0	0.32	75.6
25-01-2021	18:36:10	Monday	EVENING	2.00	115.0	0.54	87.6
25-01-2021	18:36:10	Monday	EVENING	2.00	115.0	0.54	87.6
26-01-2021	18:40:23	Tuesday	EVENING	2.00	115.0	0.65	94.3
28-01-2021	14:08:30	Thursday	DAY	5.00	115.0	0.43	94.7
29-01-2021	10:42:30	Friday	DAY	5.00	115.0	0.23	76.9
29-01-2021	18:50:00	Friday	EVENING	2.00	115.0	0.36	73.1
30-01-2021	19:30:00	Saturday	EVENING	2.00	115.0	0.38	83.8
30-01-2021	19:30:00	Saturday	EVENING	2.00	115.0	0.38	83.8
30-01-2021	23:17:45	Saturday	NIGHT	1.00	115.0	0.31	74.8
01-02-2021	00:04:00	Monday	NIGHT	1.00	115.0	0.55	78.6
01-02-2021	06:50:00	Monday	NIGHT	1.00	115.0	0.25	73.1
01-02-2021	18:32:15	Monday	EVENING	2.00	115.0	0.29	96.5
02-02-2021	18:49:45	Tuesday	EVENING	2.00	115.0	0.33	90.5
03-02-2021	18:46:10	Wednesday	EVENING	2.00	115.0	0.43	78.1
04-02-2021	06:43:00	Thursday	NIGHT	1.00	115.0	0.15	74.8
05-02-2021	06:55:10	Friday	NIGHT	1.00	115.0	0.22	79.6
05-02-2021	18:36:35	Friday	EVENING	2.00	115.0	0.38	101.3
06-02-2021	06:47:05	Saturday	NIGHT	1.00	115.0	0.20	74.8
06-02-2021	18:54:08	Saturday	EVENING	2.00	115.0	0.60	95.2
07-02-2021	06:49:10	Sunday	Sunday	1.00	115.0	0.15	75.6
07-02-2021	06:49:10	Sunday	Sunday	1.00	115.0	0.15	75.6
08-02-2021	08:24:49	Monday	DAY	5.00	115.0	0.14	82.3
08-02-2021	18:43:10	Monday	EVENING	2.00	115.0	0.40	74.8
09-02-2021	06:53:15	Tuesday	NIGHT	1.00	115.0	0.18	75.6
10-02-2021	06:48:35	Wednesday	NIGHT	1.00	115.0	0.22	78.1
10-02-2021	06:58:30	Wednesday	NIGHT	1.00	115.0	0.23	93.8
10-02-2021	13:36:20	Wednesday	DAY	5.00	115.0	0.40	91.0
10-02-2021	18:45:00	Wednesday	EVENING	2.00	115.0	0.42	80.8
11-02-2021	18:45:00	Thursday	EVENING	2.00	115.0	0.46	94.6
12-02-2021	06:44:55	Friday	NIGHT	1.00	115.0	0.29	74.8
12-02-2021	18:47:10	Friday	EVENING	2.00	115.0	0.27	74.8
12-02-2021	18:47:10	Friday	EVENING	2.00	115.0	0.27	74.8
13-02-2021	13:35:35	Saturday	DAY	5.00	115.0	0.38	93.8

13-02-2021	18:55:10	Saturday	EVENING	2.00	115.0	0.32	97.1
14-02-2021	01:41:00	Sunday	Sunday	1.00	115.0	0.16	75.6
15-02-2021	18:43:08	Monday	EVENING	2.00	115.0	0.53	88.5
15-02-2021	18:43:08	Monday	EVENING	2.00	115.0	0.53	88.5
15-02-2021	18:43:08	Monday	EVENING	2.00	115.0	0.53	88.5
16-02-2021	18:58:20	Tuesday	EVENING	2.00	115.0	0.41	83.2
18-02-2021	07:27:10	Thursday	DAY	5.00	115.0	0.16	74.8
18-02-2021	07:27:10	Thursday	DAY	5.00	115.0	0.16	74.8
18-02-2021	14:12:37	Thursday	DAY	5.00	115.0	0.50	75.6
18-02-2021	18:58:37	Thursday	EVENING	2.00	115.0	0.39	81.2
18-02-2021	18:58:37	Thursday	EVENING	2.00	115.0	0.39	81.2
19-02-2021	18:34:18	Friday	EVENING	2.00	115.0	0.63	73.1
19-02-2021	18:34:18	Friday	EVENING	2.00	115.0	0.63	73.1
20-02-2021	06:37:50	Saturday	NIGHT	1.00	115.0	0.21	74.8
20-02-2021	06:37:52	Saturday	NIGHT	1.00	115.0	0.21	74.8
21-02-2021	19:12:30	Sunday	Sunday	1.00	115.0	0.54	87.4
22-02-2021	06:48:33	Monday	NIGHT	1.00	115.0	0.20	73.1
22-02-2021	06:48:33	Monday	NIGHT	1.00	115.0	0.20	73.1
23-02-2021	07:15:00	Tuesday	DAY	5.00	115.0	0.14	84.3
23-02-2021	07:17:00	Tuesday	DAY	5.00	115.0	0.13	81.2
24-02-2021	06:45:00	Wednesday	NIGHT	1.00	115.0	0.07	75.6
24-02-2021	06:45:00	Wednesday	NIGHT	1.00	115.0	0.07	75.6
25-02-2021	18:53:45	Thursday	EVENING	2.00	115.0	0.58	78.1
26-02-2021	02:35:00	Friday	NIGHT	1.00	115.0	0.16	75.6
27-02-2021	01:53:20	Saturday	NIGHT	1.00	115.0	0.25	74.8
27-02-2021	06:45:45	Saturday	NIGHT	1.00	115.0	0.20	73.1
28-02-2021	07:04:08	Sunday	Sunday	1.00	115.0	0.76	83.8
28-02-2021	19:04:10	Sunday	Sunday	1.00	115.0	0.44	74.8
28-02-2021	19:04:10	Sunday	Sunday	1.00	115.0	0.44	74.8
01-03-2021	01:02:10	Monday	NIGHT	1.00	115.0	0.25	73.1
04-03-2021	14:55:45	Thursday	DAY	5.00	115.0	0.34	80.0
04-03-2021	14:58:00	Thursday	DAY	5.00	115.0	0.34	83.2
04-03-2021	18:29:43	Thursday	EVENING	2.00	115.0	0.42	85.3
05-03-2021	18:48:00	Friday	EVENING	2.00	115.0	0.35	91.6
06-03-2021	07:07:55	Saturday	DAY	5.00	115.0	0.06	75.6
06-03-2021	07:07:55	Saturday	DAY	5.00	115.0	0.06	75.6
07-03-2021	07:11:30	Sunday	Sunday	1.00	115.0	0.14	73.1
07-03-2021	14:16:38	Sunday	Sunday	1.00	115.0	0.53	78.1
08-03-2021	06:54:05	Monday	NIGHT	1.00	115.0	0.16	73.1
10-03-2021	06:44:50	Wednesday	NIGHT	1.00	115.0	0.13	74.8
11-03-2021	06:40:20	Thursday	NIGHT	1.00	115.0	0.22	76.9
11-03-2021	19:10:00	Thursday	EVENING	2.00	115.0	0.38	78.1
11-03-2021	19:10:00	Thursday	EVENING	2.00	115.0	0.38	78.1
12-03-2021	19:02:40	Friday	EVENING	2.00	115.0	0.46	73.1
12-03-2021	19:02:45	Friday	EVENING	2.00	115.0	0.46	74.8
13-03-2021	18:48:45	Saturday	EVENING	2.00	115.0	0.48	78.1
15-03-2021	07:00:16	Monday	DAY	5.00	115.0	0.20	78.1
15-03-2021	19:03:25	Monday	EVENING	2.00	115.0	0.30	83.8
18-03-2021	07:02:35	Thursday	DAY	5.00	115.0	0.15	74.8

18-03-2021	07:02:40	Thursday	DAY	5.00	115.0	0.15	74.8
18-03-2021	07:02:40	Thursday	DAY	5.00	115.0	0.15	74.8
19-03-2021	06:59:55	Friday	NIGHT	1.00	115.0	0.16	76.9
19-03-2021	07:00:00	Friday	DAY	5.00	115.0	0.17	76.9
19-03-2021	18:49:21	Friday	EVENING	2.00	115.0	0.51	82.3
20-03-2021	06:45:00	Saturday	NIGHT	1.00	115.0	0.17	75.6
20-03-2021	06:45:00	Saturday	NIGHT	1.00	115.0	0.17	75.6
21-03-2021	06:45:00	Sunday	Sunday	1.00	115.0	0.17	74.8
22-03-2021	12:25:44	Monday	DAY	5.00	115.0	0.49	79.6
23-03-2021	18:45:00	Tuesday	EVENING	2.00	115.0	0.21	84.6
24-03-2021	06:46:50	Wednesday	NIGHT	1.00	115.0	0.12	74.8
24-03-2021	06:46:50	Wednesday	NIGHT	1.00	115.0	0.12	74.8
24-03-2021	19:37:47	Wednesday	EVENING	2.00	115.0	1.87	88.0
24-03-2021	19:37:47	Wednesday	EVENING	2.00	115.0	1.87	88.0
26-03-2021	18:36:50	Friday	EVENING	2.00	115.0	0.27	74.8
27-03-2021	14:30:50	Saturday	DAY	5.00	115.0	0.29	87.4
29-03-2021	07:00:21	Monday	DAY	5.00	115.0	1.73	80.8
29-03-2021	07:00:21	Monday	DAY	5.00	115.0	1.73	80.8
29-03-2021	18:45:00	Monday	EVENING	2.00	115.0	0.26	86.0
30-03-2021	21:58:30	Tuesday	EVENING	2.00	115.0	0.20	75.6
30-03-2021	21:58:35	Tuesday	EVENING	2.00	115.0	0.25	75.6
02-04-2021	06:44:20	Friday	NIGHT	1.00	115.0	0.08	80.8
02-04-2021	06:44:20	Friday	NIGHT	1.00	115.0	0.08	80.8
03-04-2021	19:00:52	Saturday	EVENING	2.00	115.0	2.27	90.2
03-04-2021	19:00:53	Saturday	EVENING	2.00	115.0	2.27	90.2
04-04-2021	19:00:00	Sunday	Sunday	1.00	115.0	0.31	74.8
05-04-2021	06:52:40	Monday	NIGHT	1.00	115.0	0.06	74.8
06-04-2021	18:28:56	Tuesday	EVENING	2.00	115.0	0.61	78.6
07-04-2021	06:43:25	Wednesday	NIGHT	1.00	115.0	0.17	74.8
07-04-2021	06:43:25	Wednesday	NIGHT	1.00	115.0	0.17	74.8
07-04-2021	19:13:11	Wednesday	EVENING	2.00	115.0	0.55	78.1
08-04-2021	18:45:00	Thursday	EVENING	2.00	115.0	0.34	73.1
08-04-2021	18:54:55	Thursday	EVENING	2.00	115.0	0.34	73.1
09-04-2021	18:50:00	Friday	EVENING	2.00	115.0	0.28	73.1
10-04-2021	18:44:57	Saturday	EVENING	2.00	115.0	0.47	78.1
10-04-2021	18:44:57	Saturday	EVENING	2.00	115.0	0.47	78.1
11-04-2021	06:48:00	Sunday	Sunday	1.00	115.0	0.06	82.3
12-04-2021	19:02:40	Monday	EVENING	2.00	115.0	0.16	73.1
12-04-2021	19:41:05	Monday	EVENING	2.00	115.0	0.30	74.8
13-04-2021	18:38:55	Tuesday	EVENING	2.00	115.0	0.25	73.1
13-04-2021	18:38:55	Tuesday	EVENING	2.00	115.0	0.25	73.1
13-04-2021	18:38:55	Tuesday	EVENING	2.00	115.0	0.25	73.1
15-04-2021	01:30:00	Thursday	NIGHT	1.00	115.0	0.08	74.8
16-04-2021	18:00:10	Friday	EVENING	2.00	115.0	0.23	73.1
16-04-2021	18:00:10	Friday	EVENING	2.00	115.0	0.23	73.1
17-04-2021	19:02:55	Saturday	EVENING	2.00	115.0	0.16	74.8
17-04-2021	19:02:55	Saturday	EVENING	2.00	115.0	0.16	74.8
18-04-2021	06:54:35	Sunday	Sunday	1.00	115.0	0.18	74.8
18-04-2021	15:10:50	Sunday	Sunday	1.00	115.0	0.20	86.4

18-04-2021	15:10:50	Sunday	Sunday	1.00	115.0	0.20	86.4
18-04-2021	18:45:00	Sunday	Sunday	1.00	115.0	0.17	73.1
19-04-2021	01:30:00	Monday	NIGHT	1.00	115.0	0.12	74.8
19-04-2021	19:02:40	Monday	EVENING	2.00	115.0	0.26	74.8
20-04-2021	00:30:00	Tuesday	NIGHT	1.00	115.0	0.07	75.6
20-04-2021	06:35:30	Tuesday	NIGHT	1.00	115.0	0.14	73.1
20-04-2021	06:44:20	Tuesday	NIGHT	1.00	115.0	0.15	74.8
20-04-2021	06:52:15	Tuesday	NIGHT	1.00	115.0	0.14	73.1
20-04-2021	19:24:40	Tuesday	EVENING	2.00	115.0	0.20	73.1
21-04-2021	06:44:54	Wednesday	NIGHT	1.00	115.0	1.14	88.5
21-04-2021	18:50:00	Wednesday	EVENING	2.00	115.0	0.13	74.8
22-04-2021	19:00:00	Thursday	EVENING	2.00	115.0	0.13	73.1
22-04-2021	19:35:00	Thursday	EVENING	2.00	115.0	0.11	74.8
23-04-2021	00:08:55	Friday	NIGHT	1.00	115.0	0.09	74.8
23-04-2021	13:15:18	Friday	DAY	5.00	115.0	1.44	86.0
23-04-2021	18:59:00	Friday	EVENING	2.00	115.0	0.17	79.6
23-04-2021	18:59:00	Friday	EVENING	2.00	115.0	0.17	79.6
23-04-2021	18:59:00	Friday	EVENING	2.00	115.0	0.17	79.6
24-04-2021	19:15:40	Saturday	EVENING	2.00	115.0	0.37	75.6
26-04-2021	18:45:00	Monday	EVENING	2.00	115.0	0.17	85.8
27-04-2021	19:05:00	Tuesday	EVENING	2.00	115.0	0.20	73.1
29-04-2021	07:06:30	Thursday	DAY	5.00	115.0	0.10	75.6
29-04-2021	07:27:20	Thursday	DAY	5.00	115.0	0.11	74.8
29-04-2021	07:27:25	Thursday	DAY	5.00	115.0	0.10	74.8
30-04-2021	06:52:00	Friday	NIGHT	1.00	115.0	0.12	74.8
30-04-2021	06:52:00	Friday	NIGHT	1.00	115.0	0.12	74.8
01-05-2021	06:42:15	Saturday	NIGHT	1.00	115.0	0.11	96.6
01-05-2021	06:42:15	Saturday	NIGHT	1.00	115.0	0.11	96.6
02-05-2021	06:57:00	Sunday	Sunday	1.00	115.0	0.07	81.9
03-05-2021	06:32:00	Monday	NIGHT	1.00	115.0	0.06	74.8
03-05-2021	06:53:05	Monday	NIGHT	1.00	115.0	0.06	85.8
03-05-2021	06:55:57	Monday	NIGHT	1.00	115.0	0.09	86.4
03-05-2021	18:52:00	Monday	EVENING	2.00	115.0	0.26	104.3
04-05-2021	07:07:40	Tuesday	DAY	5.00	115.0	0.11	91.0
04-05-2021	07:07:40	Tuesday	DAY	5.00	115.0	0.11	91.0
04-05-2021	07:07:40	Tuesday	DAY	5.00	115.0	0.11	91.0
05-05-2021	02:30:00	Wednesday	NIGHT	1.00	115.0	0.11	75.6
05-05-2021	19:50:00	Wednesday	EVENING	2.00	115.0	0.14	74.8
05-05-2021	19:50:00	Wednesday	EVENING	2.00	115.0	0.14	74.8
06-05-2021	00:20:00	Thursday	NIGHT	1.00	115.0	0.10	73.1
06-05-2021	18:55:35	Thursday	EVENING	2.00	115.0	0.21	74.8
07-05-2021	18:51:00	Friday	EVENING	2.00	115.0	0.22	74.8
07-05-2021	18:51:00	Friday	EVENING	2.00	115.0	0.22	74.8
07-05-2021	18:51:00	Friday	EVENING	2.00	115.0	0.22	74.8
08-05-2021	18:57:13	Saturday	EVENING	2.00	115.0	0.58	81.2
09-05-2021	07:00:00	Sunday	Sunday	1.00	115.0	0.09	74.8
09-05-2021	13:00:00	Sunday	Sunday	1.00	115.0	0.23	79.6
09-05-2021	13:00:00	Sunday	Sunday	1.00	115.0	0.23	79.6
10-05-2021	18:45:00	Monday	EVENING	2.00	115.0	0.21	73.1

10-05-2021	18:45:00	Monday	EVENING	2.00	115.0	0.21	73.1
10-05-2021	18:45:00	Monday	EVENING	2.00	115.0	0.21	73.1
12-05-2021	06:31:20	Wednesday	NIGHT	1.00	115.0	0.06	74.8
13-05-2021	07:17:40	Thursday	DAY	5.00	115.0	0.17	75.6
13-05-2021	07:28:40	Thursday	DAY	5.00	115.0	0.18	98.1
13-05-2021	18:53:50	Thursday	EVENING	2.00	115.0	0.27	75.6
13-05-2021	18:53:52	Thursday	EVENING	2.00	115.0	0.22	75.6
14-05-2021	06:53:30	Friday	NIGHT	1.00	115.0	0.08	92.5
14-05-2021	07:01:47	Friday	DAY	5.00	115.0	0.07	92.5
15-05-2021	06:45:00	Saturday	NIGHT	1.00	115.0	0.07	82.3
15-05-2021	06:45:00	Saturday	NIGHT	1.00	115.0	0.07	82.3
16-05-2021	07:01:40	Sunday	Sunday	1.00	115.0	0.25	75.6
16-05-2021	07:01:40	Sunday	Sunday	1.00	115.0	0.25	75.6
16-05-2021	07:01:40	Sunday	Sunday	1.00	115.0	0.25	75.6
16-05-2021	07:10:00	Sunday	Sunday	1.00	115.0	0.24	75.6
16-05-2021	18:45:00	Sunday	Sunday	1.00	115.0	0.06	75.6
17-05-2021	07:01:10	Monday	DAY	5.00	115.0	0.46	78.6
17-05-2021	07:01:10	Monday	DAY	5.00	115.0	0.46	78.6
17-05-2021	07:01:15	Monday	DAY	5.00	115.0	0.46	78.6
17-05-2021	18:46:10	Monday	EVENING	2.00	115.0	0.13	74.8
17-05-2021	18:46:10	Monday	EVENING	2.00	115.0	0.13	74.8
18-05-2021	06:49:45	Tuesday	NIGHT	1.00	115.0	0.13	75.6
19-05-2021	06:53:25	Wednesday	NIGHT	1.00	115.0	0.22	75.6
19-05-2021	06:55:30	Wednesday	NIGHT	1.00	115.0	0.22	76.9
19-05-2021	18:45:00	Wednesday	EVENING	2.00	115.0	0.13	74.8
20-05-2021	18:45:00	Thursday	EVENING	2.00	115.0	0.14	75.6
20-05-2021	18:45:00	Thursday	EVENING	2.00	115.0	0.14	75.6
21-05-2021	12:08:01	Friday	DAY	5.00	115.0	0.39	85.1
21-05-2021	18:45:10	Friday	EVENING	2.00	115.0	0.17	74.8
22-05-2021	18:45:00	Saturday	EVENING	2.00	115.0	0.17	75.6
24-05-2021	07:00:48	Monday	DAY	5.00	115.0	0.34	76.9
24-05-2021	13:22:00	Monday	DAY	5.00	115.0	0.23	78.1
25-05-2021	00:30:00	Tuesday	NIGHT	1.00	115.0	0.05	74.8
25-05-2021	07:08:30	Tuesday	DAY	5.00	115.0	0.09	74.8
25-05-2021	14:23:15	Tuesday	DAY	5.00	115.0	0.26	87.4
25-05-2021	18:45:00	Tuesday	EVENING	2.00	115.0	0.24	74.8
26-05-2021	06:54:30	Wednesday	NIGHT	1.00	115.0	0.05	74.8
27-05-2021	18:31:22	Thursday	EVENING	2.00	115.0	0.32	78.6
31-05-2021	07:05:20	Monday	DAY	5.00	115.0	0.23	75.6
01-06-2021	06:43:35	Tuesday	NIGHT	1.00	115.0	0.16	74.8
02-06-2021	06:36:55	Wednesday	NIGHT	1.00	115.0	0.19	75.6
02-06-2021	06:39:30	Wednesday	NIGHT	1.00	115.0	0.07	74.8
02-06-2021	19:00:00	Wednesday	EVENING	2.00	115.0	0.13	75.6
04-06-2021	19:04:00	Friday	EVENING	2.00	115.0	0.17	74.8
04-06-2021	19:04:00	Friday	EVENING	2.00	115.0	0.17	74.8
04-06-2021	19:04:00	Friday	EVENING	2.00	115.0	0.17	74.8
05-06-2021	19:08:11	Saturday	EVENING	2.00	115.0	0.19	78.1
05-06-2021	19:08:11	Saturday	EVENING	2.00	115.0	0.19	78.1
06-06-2021	19:01:00	Sunday	Sunday	1.00	115.0	0.10	83.8

06-06-2021	19:01:00	Sunday	Sunday	1.00	115.0	0.10	83.8
07-06-2021	18:44:18	Monday	EVENING	2.00	115.0	0.21	73.1
08-06-2021	00:00:10	Tuesday	NIGHT	1.00	115.0	0.18	85.3
09-06-2021	18:34:00	Wednesday	EVENING	2.00	115.0	0.10	95.8
09-06-2021	18:34:00	Wednesday	EVENING	2.00	115.0	0.10	95.8
10-06-2021	07:00:00	Thursday	DAY	5.00	115.0	0.08	88.9
10-06-2021	18:47:00	Thursday	EVENING	2.00	115.0	0.06	74.8
11-06-2021	06:54:10	Friday	NIGHT	1.00	115.0	0.15	74.8
12-06-2021	07:05:25	Saturday	DAY	5.00	115.0	0.19	75.6
12-06-2021	07:05:25	Saturday	DAY	5.00	115.0	0.37	78.1
12-06-2021	07:05:25	Saturday	DAY	5.00	115.0	0.37	78.1
12-06-2021	07:05:25	Saturday	DAY	5.00	115.0	0.37	78.1
12-06-2021	18:00:10	Saturday	EVENING	2.00	115.0	0.12	74.8
14-06-2021	14:05:35	Monday	DAY	5.00	115.0	0.37	75.6
14-06-2021	18:00:10	Monday	EVENING	2.00	115.0	0.14	75.6
15-06-2021	18:51:25	Tuesday	EVENING	2.00	115.0	0.12	75.6
16-06-2021	06:51:00	Wednesday	NIGHT	1.00	115.0	0.06	74.8
17-06-2021	06:48:43	Thursday	NIGHT	1.00	115.0	0.40	78.1
17-06-2021	06:48:43	Thursday	NIGHT	1.00	115.0	0.40	78.1
18-06-2021	07:03:35	Friday	DAY	5.00	115.0	0.06	75.6
18-06-2021	19:00:00	Friday	EVENING	2.00	115.0	0.05	82.9
19-06-2021	06:53:40	Saturday	NIGHT	1.00	115.0	0.05	79.6
19-06-2021	06:53:40	Saturday	NIGHT	1.00	115.0	0.05	79.6
20-06-2021	06:45:00	Sunday	Sunday	1.00	115.0	0.19	78.6
21-06-2021	06:41:40	Monday	NIGHT	1.00	115.0	0.19	75.6
22-06-2021	06:59:30	Tuesday	NIGHT	1.00	115.0	0.18	94.7
22-06-2021	07:00:27	Tuesday	DAY	5.00	115.0	0.22	78.1
22-06-2021	18:39:15	Tuesday	EVENING	2.00	115.0	0.10	75.6
23-06-2021	06:42:10	Wednesday	NIGHT	1.00	115.0	0.06	84.3
23-06-2021	06:50:05	Wednesday	NIGHT	1.00	115.0	0.06	88.1
23-06-2021	19:15:00	Wednesday	EVENING	2.00	115.0	0.09	88.5
24-06-2021	07:52:28	Thursday	DAY	5.00	115.0	0.27	83.8
24-06-2021	07:52:28	Thursday	DAY	5.00	115.0	0.27	83.8
25-06-2021	06:50:15	Friday	NIGHT	1.00	115.0	0.11	74.8
25-06-2021	19:15:00	Friday	EVENING	2.00	115.0	0.06	74.8
26-06-2021	17:06:43	Saturday	DAY	5.00	115.0	0.33	78.1
27-06-2021	01:30:00	Sunday	Sunday	1.00	115.0	0.17	76.9
27-06-2021	06:49:30	Sunday	Sunday	1.00	115.0	0.18	75.6
29-06-2021	06:48:00	Tuesday	NIGHT	1.00	115.0	0.10	75.6
29-06-2021	06:53:40	Tuesday	NIGHT	1.00	115.0	0.10	74.8
30-06-2021	06:44:20	Wednesday	NIGHT	1.00	115.0	0.06	76.9
30-06-2021	14:04:05	Wednesday	DAY	5.00	115.0	0.15	82.3
30-06-2021	18:58:28	Wednesday	EVENING	2.00	115.0	0.24	76.9

Appendix C Attended Noise Monitoring Report

Noise Monitoring Assessment

Hera Gold Mine
Nymagee, NSW
2021

Document Information

Noise Monitoring Assessment

Hera Gold Mine

Nymagee, NSW

2021

Prepared for: Aurelia Metals Limited

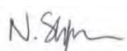

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MAC190976RP3	Final	19 May 2021	Nicholas Shipman		Oliver Muller	

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APPENDIX A - GLOSSARY OF TERMS

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Aurelia Metals Ltd (AM) to complete a Noise Monitoring Assessment (NMA) for Hera Gold Mine (HGM), Nymagee, NSW.

The NMA included quantifying the noise contribution of the HGM by direct attended measurements to determine mining noise emissions.

The assessment has been conducted in accordance with the following documents:

- Department of Planning and Environment (DPE), Project Approval 10_0191 (PA), modified on September 2016;
- Aurelia Metals Limited, Noise Management Plan (NMP), approved on 19 August 2013;
- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA), Environment Protection Licence EPL #20179 (EPL); and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

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2 Noise Criteria

2.1 Operational Noise Criteria

The Hera Gold Mine (HGM) is located at Nymagee, NSW approximately 6 km south of the town centre. Receivers in the locality surrounding the HGM are primarily rural residential. Four residential receivers included in this assessment are located on Burthong Road.

2.2 Noise Monitoring Locations

Monitoring locations that are representative of all assessment locations were selected in accordance with the EPL and Project Approval and are representative of the nearest noise sensitive receivers to the HGM. Three monitoring locations have been selected as part of the NMA and are presented in **Table 1**.

Table 1 Noise Monitoring Locations				
Monitoring Location	Receivers	Address	MGA 55	MGA 55
			Easting, m	Northing, m
NM1	R1, R2	688 Burthong Road, Nymagee	434382	6444403
NM2	R3	224 Burthong Road, Nymagee	434809	6448336
NM3	R4	39 Burthong Road, Nymagee	435200	6450737

The relevant noise criteria for each noise catchment outlined in the EPL is presented in **Table 2**. **Figure 1** presents a visual representation of the assessed receivers.

Table 2 Noise Criteria, dBA				
Receivers	Day ^{1,2}	Evening ^{1,2}	Night ^{1,2}	
	LAeq(15min)	LAeq(15min)	LAeq(15min)	LA1(1min)
R1, R2, R3, R4 Burthong Road Nymagee, NSW	35	35	35	45

Note 1: Noise criteria in accordance with L4.1 of the EPL and the Project Approval.

Note 2: Day - the period from 7am to 6pm Monday to Friday; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Conditions L4.2 to L4.8 of the EPL set out the conditions under which the noise limits apply and are reproduced below.

L4.2 For the purpose of condition L4.1:

- *Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.*
- *Evening is defined as the period 6pm to 10pm.*
- *Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.*
- *LAeq(15 minute) is defined as the continuous 'A' weighted sound pressure level-the energy average of the noise measured over a 15 minute period; and*
- *LA1 (1 minute) is defined as the sound pressure level exceeded for one percent of a 1 minute measurement period.*

L4.3 The noise limits set out in condition L4.1 apply under all meteorological conditions except for the following:

- *Wind speeds greater than 3m/second at 10 metres above ground level;*
- *Stability category G temperature inversion conditions and wind speeds greater than 2m/second at 10 metres above ground level;*

L4.4 For the purposes of condition L4.3:

- *The meteorological data to be used for determining meteorological conditions is the data recorded by the on-site meteorological weather station at the Hera project site at Nymagee.*
- *Temperature inversion will be assessed by use of the sigma-theta process as outlined in Appendix E4 of the NSW Industrial Noise Policy (INP).*

L4.5 For the purpose of determining the noise generated at the premises Class 1 or 2 noise monitoring equipment as defined by AS IEC61672.1-2004 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing, must be used.

L4.6 To determine compliance:

a) With the LAeq(15min) noise limits in condition L4.1, the noise measurement equipment must be located:

- *within 30 metres of a dwelling façade, but not closer than 3 metres, where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises;*
- *approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises;*
- *within approximately 50 metres of the boundary of a National Park or a Nature Reserve.*

b) With the LA1(1 minute) noise limits in condition L4.1; the noise monitoring equipment must be located within 1 metre of a dwelling façade.

c) The noise monitoring equipment must be located in a position that is:

- *at the most affected point at a location where there is no dwelling at the location; or*
- *at the most affected point within an area at a location prescribed by conditions L4.6(a) or L4.6(b).*

L4.7 A breach of this Environmental Protection License will still occur where noise generated from the premises in excess of the appropriate limit specified in the condition L4.1 is detected:

- *at a location other than an area prescribed by conditions L4.6(a) and L4.6(b); and/or*
- *at a point other than the most affected point at a location.*

L4.8 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy (INP) must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

2.3 Low Frequency Noise Criteria

Section L4.8 of the EPL states that modifying factor adjustments outlined in Fact Sheet C of the NPI requires an assessment of low frequency (LF) noise generated by HGM to be quantified. The LF requirement is reproduced below along with one third octave LZeq(15min) thresholds presented in **Table 3**.

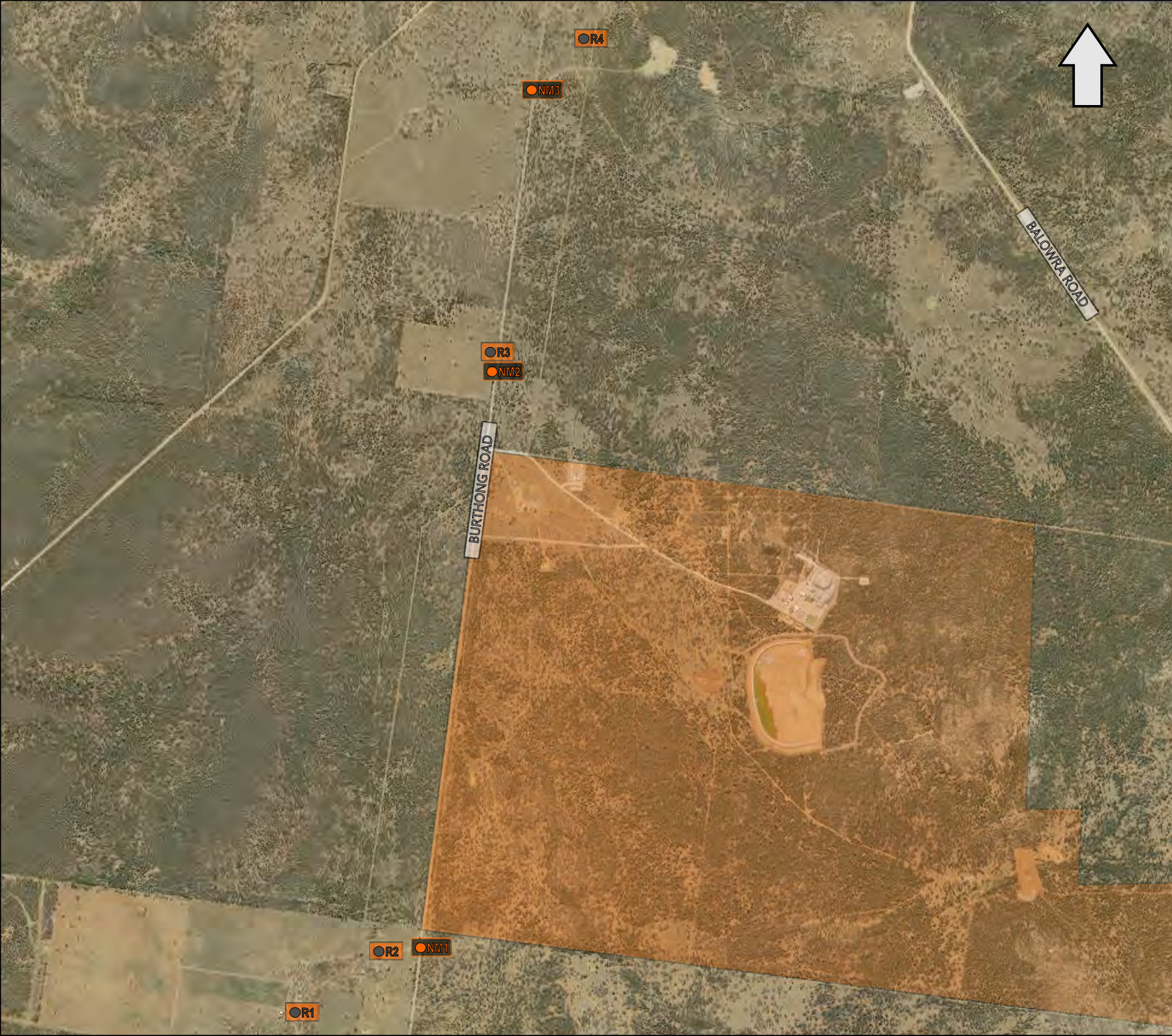
Measure/assess C and A weighted Leq,T levels over the same time period. Where the C minus A level is 15dB or more and:

- *where any of the 1/3 octave noise levels in Table 4-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.*
- *where any of the 1/3 octave noise levels in Table 4-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.*

Table 3 One-third octave low frequency noise thresholds

Hz/dB(Z)	One-third octave LZeq 15minute threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

FIGURE 1
LOCALITY PLAN
REF: MAC190976



KEY

- RECEIVER LOCATION
- NOISE MONITORING LOCATION
- SITE LOCATION



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3 Methodology

Noise monitoring consisted of operator attended monitoring during the daytime, evening and night time periods.

3.1 Attended Noise Monitoring

Operator attended noise monitoring was conducted in general accordance with the procedures described in Australian Standard AS 1055:2018. All measurements were carried out using a Svantek Type 1, 971 noise analyser on Tuesday 11 May 2021 and Wednesday 12 May 2021. The acoustic instrumentation used carries current NATA calibration and complies with AS IEC 61672:2019 - Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dBA.

Attended noise monitoring included one 15 minute measurement during daytime, evening and night time periods. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source.

Extraneous sources were excluded from the analysis to determine the LAeq(15min) HGM noise contribution for comparison against the relevant criteria.

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4 Results

4.1 Attended Noise Monitoring Results

4.1.1 Attended Assessment Results - Location NM1

The monitored noise level contributions and observed meteorological conditions for each assessment period at location NM1 for the NMA are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location NM1

Date	Time (hrs)	Descriptor (dBA re 20 µPa)				Meteorology	Description and SPL, dBA
		L _{Amax}	L _{A1}	L _{Aeq}	L _{A90}		
12/05/2021	09:24	51	41	28	14	WD: S	Birds 13-51
	(Day)					WS: 0.1m/s	Aircraft 13-22
HGM L _{Aeq} (15min) Contribution							HGM Inaudible
11/05/2021	18:56	76	47	29	14	WD: W	Traffic 13-76
	(Evening)					WS: 0.1m/s	Aircraft 17-22
HGM L _{Aeq} (15min) Contribution							HGM Inaudible
11/05/2021	22:00	42	32	22	14	WD: W	Insects 13-22
	(Night)					WS: 0.1m/s	Traffic 13-20
HGM L _{Aeq} (15min) Contribution							HGM Inaudible
HGM L _A (1min) Contribution							HGM Inaudible

Note: Day - the period from 7am to 6pm Monday to Friday; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.1.2 Attended Assessment Results - Location NM2

The monitored noise level contributions and observed meteorological conditions for each assessment period at location NM2 for the NMA are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location NM2							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)				Meteorology	Description and SPL, dBA
		L _{Amax}	L _{A1}	L _{Aeq}	L _{A90}		
12/05/2021	09:46 (Day)	81	71	57	27	WD: S	Birds 25-60
						WS: 0.8m/s	Wind in trees 25-29
						Rain: Nil	Traffic 25-81
							Insects <22
HGM L _{Aeq} (15min) Contribution							HGM Inaudible
11/05/2021	19:44 (Evening)	75	49	46	13	WD: W	Traffic 13-75
						WS: 0.1m/s	Insects 13-28
						Rain: Nil	Birds 22-32
HGM L _{Aeq} (15min) Contribution							HGM Inaudible
11/05/2021	22:24 (Night)	44	35	23	13	WD: W	Insects 13-17
						WS: 0.1m/s	Operator 13-44
						Rain: Nil	Birds 13-24
							Mouse 13-28
HGM L _{Aeq} (15min) Contribution							HGM Inaudible
HGM L _A (1min) Contribution							HGM Inaudible

Note: Day - the period from 7am to 6pm Monday to Friday; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.1.3 Attended Assessment Results - Location NM3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location NM3 for the NMA are presented in **Table 6**.

Table 6 Operator-Attended Noise Survey Results – Location NM3							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)				Meteorology	Description and SPL, Dba
		L _{Amax}	L _{A1}	L _{Aeq}	L _{A90}		
12/05/2021	10:06 (Day)	85	66	58	23	WD: S	Birds 20-33
						WS: 0.1m/s	Wind in trees <20
						Rain: Nil	Traffic 20-85
						HGM L _{Aeq} (15min) Contribution	
11/05/2021	19:22 (Evening)	86	72	60	13	WD: W	Traffic 13-86
						WS: 0.3m/s	Insects 13-17
						Rain: Nil	Operator 13-31
						HGM L _{Aeq} (15min) Contribution	
11/05/2021	22:49 (Night)	82	59	53	14	WD: W	Operator 13-29
						WS: 0.1m/s	Birds 13-31
						Rain: Nil	Traffic 13-82
						HGM L _{Aeq} (15min) Contribution	
HGM L _A (1min) Contribution		HGM Inaudible					

Note: Day - the period from 7am to 6pm Monday to Friday; Evening - the period from 6pm to 10pm; Night - the remaining periods.

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5 Low Frequency Noise Assessment

The low-frequency assessment summary for each monitoring location NM1 to NM3 are presented in **Table 7** to **Table 9** for each assessment period.

Table 7 Daytime Low Frequency Compliance Assessment

Receiver No.	dB LCeq(15min)	dB LAeq(15min)	Difference	Mitigation Trigger
NM1	45	28	17	✓
NM2	62	57	5	×
NM3	61	58	3	×

Note: Day - the period from 7am to 6pm Monday to Saturday, 8am to 6pm Sundays and public holidays.

Table 8 Evening Low Frequency Compliance Assessment

Receiver No.	dB LCeq(15min)	dB LAeq(15min)	Difference	Mitigation Trigger
NM1	55	29	26	✓
NM2	49	46	3	×
NM3	62	60	2	×

Note: Evening - the period from 6pm to 10pm Monday to Sunday.

Table 9 Night Low Frequency Compliance Assessment

Receiver No.	dB LCeq(15min)	dB LAeq(15min)	Difference	Mitigation Trigger
NM1	47	22	15	✓
NM2	39	23	16	✓
NM3	56	53	3	×

Note: Night - the period from 10pm to 7am Monday to Saturday, 10pm to 8am Sundays and public holidays.

5.1 Low Frequency Noise Assessment Discussion

The $L_{Ceq}(15min)$ exceeded the $L_{Aeq}(15min)$ by more than 15dB on three occasions during the NMA. HGM remained inaudible during all three occasions.

During the three measurements with 15dB difference between $L_{Ceq}(15min)$ and $L_{Aeq}(15min)$ levels are attributed to other non-site related sources such as road traffic, which was audible throughout the three measurements, and therefore no mitigation measures are required.

6 Discussion of Results

6.1 Discussion of Results - Location NM1

HGM noise emissions were inaudible during daytime, evening and night measurements conducted on Tuesday 11 May 2021 and Wednesday 12 May 2021 satisfying the relevant noise limit of 35dB LAeq(15min) at NM1.

Extraneous noise sources included birds, aircraft, traffic, insects and livestock.

6.2 Discussion of Results - Location NM2

HGM noise emissions were inaudible during daytime, evening and night measurements conducted on Tuesday 11 May 2021 and Wednesday 12 May 2021 satisfying the relevant noise limit of 35dB LAeq(15min) at NM2.

Extraneous noise sources included birds, wind in trees, traffic, insects, operator noise and mice.

6.3 Discussion of Results - Location NM3

HGM noise emissions were inaudible during daytime, evening and night measurements conducted on Tuesday 11 May 2021 and Wednesday 12 May 2021 satisfying the relevant noise limit of 35dB LAeq(15min) at NM3.

Extraneous noise sources included birds, wind in trees, traffic, insects and operator noise.

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7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of Aurelia Metals Limited for the Hera Gold Mine (HGM), at Nymagee, NSW. The assessment was completed to assess compliance with the relevant noise criteria for EPL #20179.

Attended noise monitoring was completed on Tuesday 11 May 2021 and Wednesday 12 May 2021 at three representative monitoring locations. The assessment has identified that noise emissions generated by HGM remained inaudible at all assessed receivers, therefore satisfying relevant noise criteria.

An assessment of low frequency noise was also completed and identified compliance with the relevant criteria.

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Appendix A - Glossary of Terms

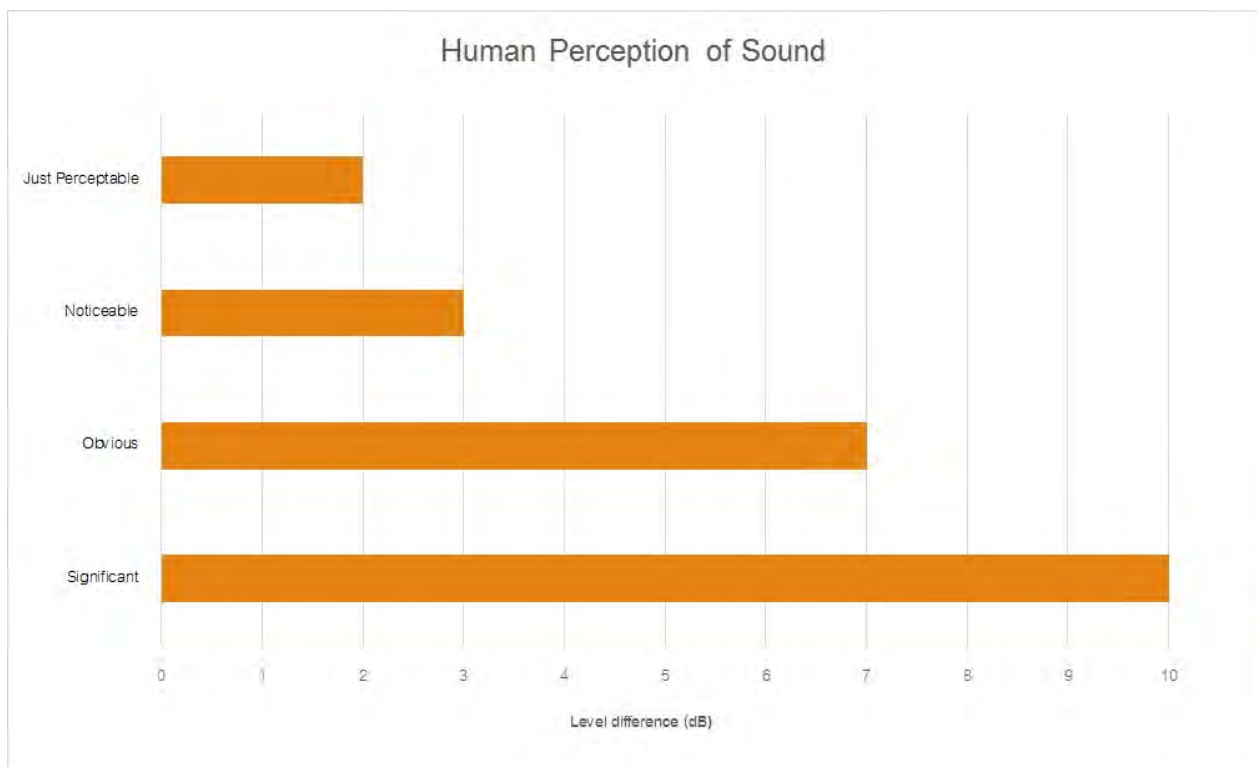
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAm _{ax}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by: $= 10 \cdot \log_{10} (W/W_0)$ Where: W is the sound power in watts and W ₀ is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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	Hera Annual Review 2020-2021	
	Author	B Topp (SLR) and J.Thompson (Hera)
	Reporting period	1 July 2020 to 30 June 2021

Appendix D SGM Environmental, Annual Report Capillary Rise Assessment



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25 January 2021

Liam Richards
Environmental Advisor
Hera Resources Pty Limited
GPO Box 7
Brisbane QLD 4001

Re: | Capillary Rise Assessment of the Intermediate Bulk Container Cover Trials at Hera Mine

Dear Liam

1.0 Introduction

SGM environmental Pty Limited (SGME) was engaged by Hera Resources Pty Limited (Hera Resources) to decommission the intermediate bulk container (IBC) cover trials and complete a capillary rise assessment (the assessment). The objective of the assessment was to determine the need for a capillary break layer in the cover to restrict the upwards rise of salts, metals and metalloids from the underlying tailings.

Hera Mine (the Mine) is a polymetallic underground mining operation owned by Aurelia Metals Limited (formerly YTC Resources Limited) and operated by its wholly owned subsidiary, Hera Resources. The Mine is approximately (~) 100 kilometres (km) south-east of Cobar in central New South Wales (NSW).

1.1 Background

1.1.1 IBC cover trials

EMM Consulting Pty Limited (EMM) commissioned three IBC cover trials in December 2017:

- a 0.2 metre (m) cover of soil;
- a 0.4 m cover of soil; and
- a 0.6 m cover of soil.

Under the guidance of SGME, the IBC cover trials were subjected to approximately (~) a years' worth of rainfall over a four-month period to develop a maximum water balance. The IBC cover trials showed that the optimum cover thickness is 0.6 m.

In October 2018, the 0.2 m cover was decommissioned as it was unlikely to be successful in limiting seepage. A 0.8 m cover was constructed in place of the 0.2 m cover to get an understanding of the performance of a cover closer to the upper end of the original recommendation (EMM 2016) (0.4-1 m). The 0.8 m cover was subjected to ~ 412 millimetres (mm) of artificial and natural rainfall over a seven-month period to develop a maximum water balance. The 0.4 m, 0.6 m and 0.8 m covers were then moved outside and subjected to natural evaporation and rainfall.



The repeated shrinking and swelling of the IBC resulted in preferential flow paths along the interface of the IBC and the cover. The IBCs were found to be unsuitable for trialling cover options over a multi-year timeframe. It was recommended that the three IBC cover trials (0.4 m, 0.6 m and 0.8 m) be decommissioned and the preferred covers (0.6 m and 0.8 m) recommissioned in large steel columns (the steel column trials).

2.0 Method

2.1 Decommissioning the IBC cover trials

The IBC cover trials were decommissioned using an angle grinder to cut the front face off each IBC (Photo 1). The volumetric water content (VWC) and matric suction sensors were removed for use to recommission the preferred covers in large steel columns.



Photo 1 Decommissioning the IBC cover trials

2.2 Sampling for capillary rise

During decommissioning of the IBC cover trials, samples were taken from the following depths:

For the 0.4 m cover:

- 0-10 cm below ground level (bgl) (soil);
- 10-20 cm bgl (soil);
- 20-30 cm bgl (soil);
- 30-40 cm bgl (soil);
- 40-60 cm bgl (tailings); and



- 70-90 cm bgl (tailings).

For the 0.6 m cover:

- 0-10 cm bgl (soil);
- 10-20 cm bgl (soil);
- 20-30 cm bgl (soil);
- 30-40 cm bgl (soil);
- 40-50 cm bgl (soil);
- 50-60 cm bgl (soil); and
- 60-80 cm bgl (tailings).

For the 0.8 m cover:

- 0-20 cm bgl (soil);
- 20-40 cm bgl (soil);
- 40-60 cm bgl (soil); and
- 60-80 cm bgl (soil).

Three samples were taken at each depth (ie three vertical 'slices' across each IBC) and composited before being sent to the laboratory for analysis.

2.3 Field testing

All samples were analysed in the field for pH and electrical conductivity (EC) (Appendix A).

2.4 Laboratory analysis

A National Association of Testing Authorities (NATA) accredited laboratory (SGS Australia Pty Limited (SGS)) was used to make sure that testing was done using scientifically correct methods.

Samples were analysed by SGS for:

- Australian Standard Leaching Procedure (ASLP) (AS4439.3) pH and electrical conductivity (EC);
- ASLP metals (Al, barium (Ba), Fe, manganese (Mn), Zn, As, cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), Pb, molybdenum (Mo), Ni, beryllium (Be), and mercury (Hg)).

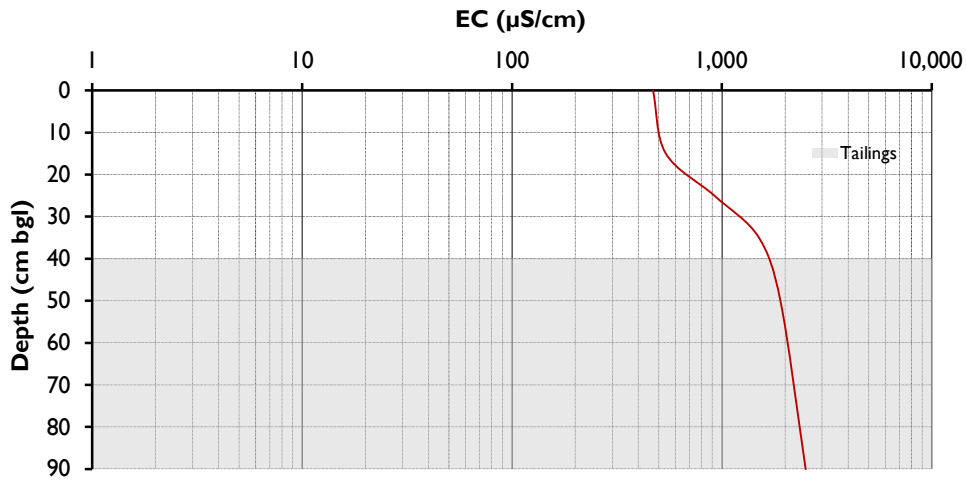
3.0 Results

The certificate of analysis is given in Appendix B.

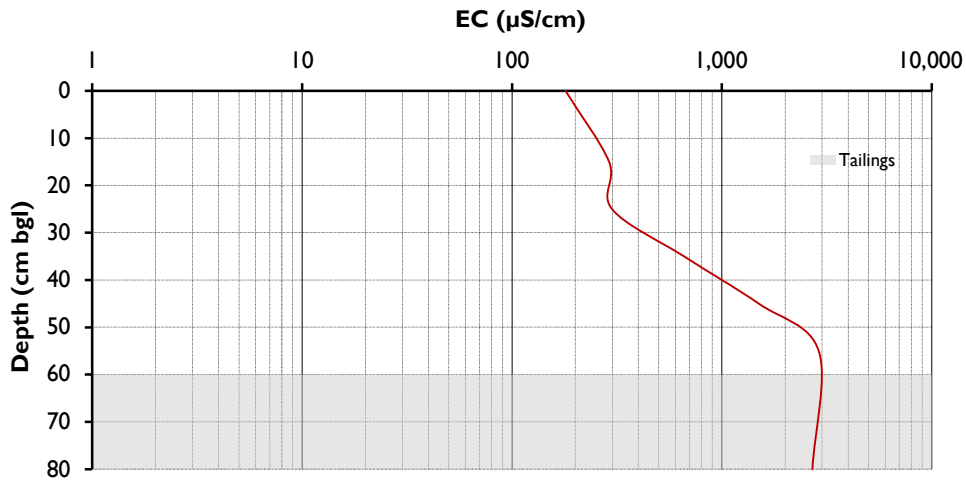
The ASLP was done using deionised water as the leaching solution to simulate rainfall infiltration. The ASLP is used to assess the risk of metalliferous or saline leachate from non-reactive material.

ASLP EC and pH results are given in Figure 1 and Figure 2 respectively. ASLP metals are given in Table 1.

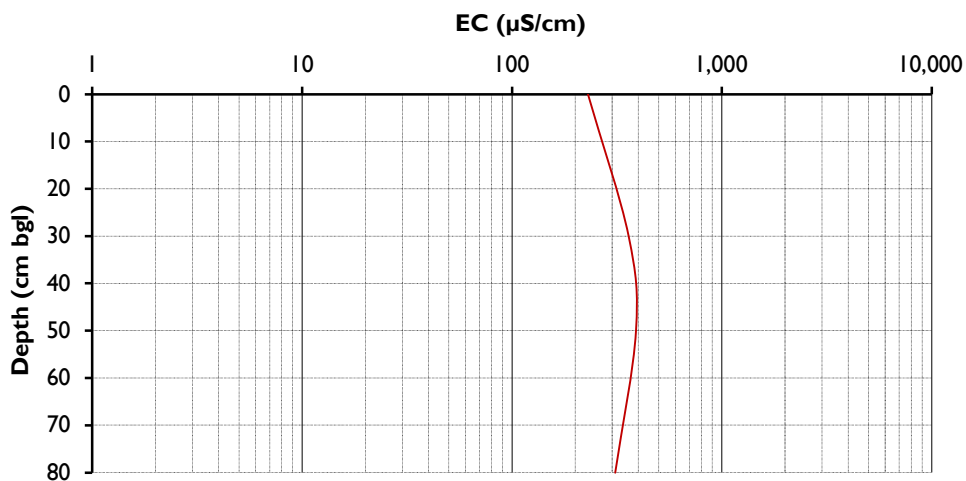




(a)



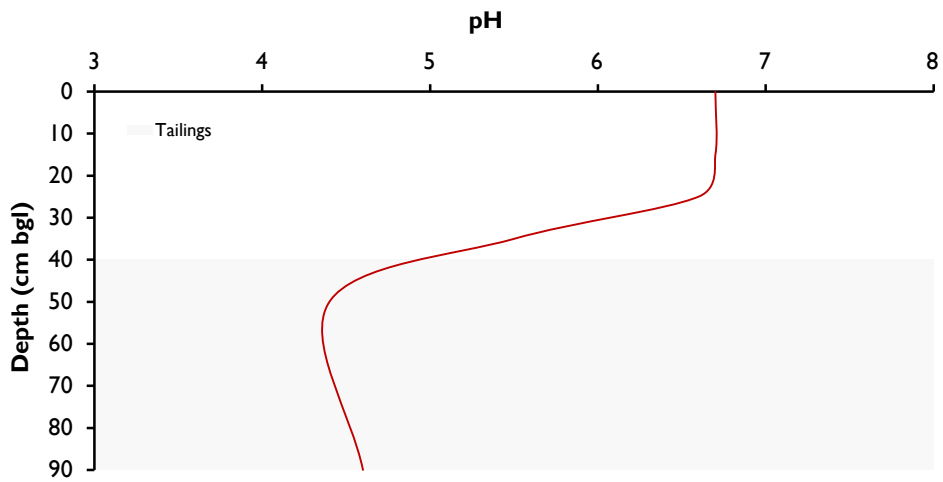
(b)



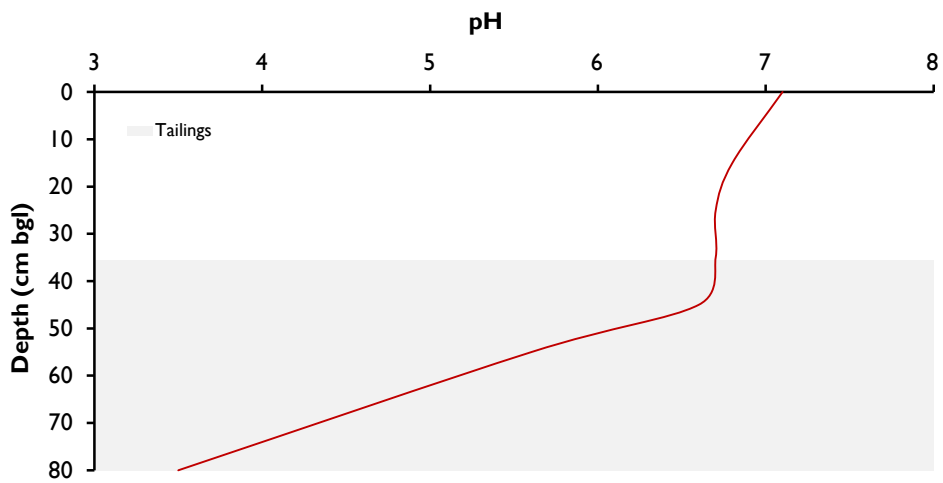
(c)

Figure I EC results (a) 0.4 m cover (b) 0.6 m cover (c) 0.8 m cover

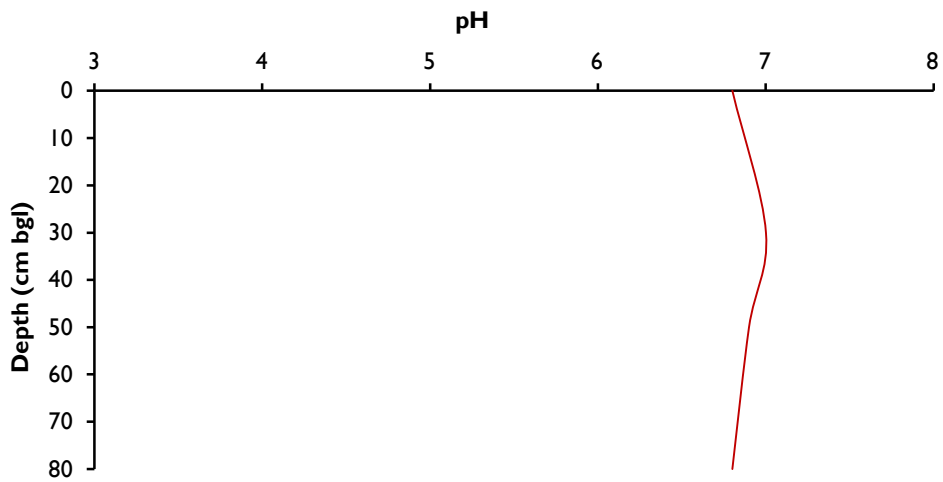




(a)



(b)



(c)

Figure 2 pH results (a) 0.4 m cover (b) 0.6 m cover (c) 0.8 m cover



Table 1 ASLP metals results

Cover	Depth	Layer	Analyte														
			Al	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Mo	Ni	Zn
Units	cm bgl	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
0.4 m	0-10	soil	0.099	<0.003	0.049	<0.0001	<0.0001	<0.0001	<0.001	0.002	0.047	0.002	0.052	<0.0001	<0.001	0.001	<0.0005
	10-20	soil	0.021	<0.003	0.058	<0.0001	<0.0001	<0.001	<0.001	0.001	0.006	0.001	0.01	<0.0001	<0.001	<0.001	<0.0005
	20-30	soil	0.022	<0.003	0.055	<0.0001	0.0004	<0.001	<0.001	0.001	<0.005	<0.001	0.12	<0.0001	<0.001	0.002	0.17
	30-40	soil	0.042	<0.003	0.044	<0.0001	0.09	0.001	0.11	0.002	<0.005	0.002	10	<0.0001	<0.001	0.25	44
0.6 m	40-60	tailings	1.3	0.022	<0.005	0.0025	0.71	0.001	0.63	0.069	5.3	3	10	<0.0001	<0.001	1.3	160
	70-90	tailings	0.77	0.022	<0.005	0.0011	1.1	0.002	1	0.021	4	3	18	<0.0001	<0.001	2.3	230
0.8 m	0-10	soil	1.8	<0.003	0.021	0.0001	0.0001	0.001	0.001	0.006	0.76	0.011	0.047	<0.0001	<0.001	0.002	0.029
	10-20	soil	0.021	<0.003	0.033	<0.0001	<0.0001	<0.001	<0.001	0.003	0.009	<0.001	0.016	<0.0001	<0.001	0.001	0.008
	20-30	soil	0.027	<0.003	0.034	<0.0001	<0.0001	<0.001	<0.001	0.002	0.01	<0.001	0.038	<0.0001	<0.001	0.001	0.006
	30-40	soil	0.017	<0.003	0.07	<0.0001	<0.0001	<0.001	<0.001	0.002	<0.005	0.001	0.1	<0.0001	<0.001	0.001	<0.0005
	40-50	soil	0.047	<0.003	0.052	<0.0001	0.0004	<0.001	0.002	0.002	0.01	0.001	1.2	<0.0001	<0.001	0.003	0.18
	50-60	soil	0.05	0.003	0.049	<0.0001	0.2	0.001	0.33	0.003	<0.005	0.005	29	<0.0001	<0.001	0.66	120
	60-80	tailings	130	0.075	<0.005	0.025	1.2	0.029	0.95	2	100	2.1	16	<0.0001	0.002	1.8	310
	0-20	soil	0.031	<0.003	0.043	<0.0001	0.0004	<0.001	<0.001	0.004	0.017	0.001	0.026	<0.0001	<0.001	0.002	0.07
	20-40	soil	0.051	<0.003	0.052	<0.0001	0.0003	<0.001	<0.001	0.005	0.024	0.001	0.042	<0.0001	<0.001	0.002	0.062
	40-60	soil	0.014	<0.003	0.053	<0.0001	0.0004	<0.001	<0.001	0.003	<0.005	0.001	0.031	<0.0001	<0.001	0.002	0.078
	60-80	soil	0.024	<0.003	0.049	<0.0001	0.0005	<0.001	<0.001	0.004	0.009	0.001	0.03	<0.0001	<0.001	0.002	0.1

1. Light grey = tailings.



4.0 Discussion

4.1 Salinity

The potential for capillary rise of salts in the 0.8 m cover could not be evaluated because there was no tailings layer in the IBC; therefore, it was used as a baseline cover.

There is evidence of capillary rise in the 0.4 m cover. EC was elevated at the base (30-40 cm bgl) of the 0.4 m cover (1,500 microsiemens per centimetre ($\mu\text{S}/\text{cm}$)) (Figure 1). The top of the 0.4 m cover (0-10 cm bgl) was slightly elevated (470 $\mu\text{S}/\text{cm}$) compared to the baseline cover (0.8 m cover), which was 230 $\mu\text{S}/\text{cm}$ at 0-20 cm bgl. Between 20-30 cm bgl, EC was 920 $\mu\text{S}/\text{cm}$. Generally, EC greater than 1,000 $\mu\text{S}/\text{cm}$ may restrict plant growth. The results suggest that only ~ half the rooting depth is able to support plant growth and the cover would likely fail. Noting that the 0.4 m cover has already been disbanded as a preferred cover based on its performance in the IBC cover trials.

EC was highly elevated at the base (50-60 cm bgl) of the 0.6 m cover (2,900 $\mu\text{S}/\text{cm}$). EC was also elevated between 40-50 cm bgl (1,500 $\mu\text{S}/\text{cm}$). EC between 30-40 cm bgl was 660 $\mu\text{S}/\text{cm}$, which was greater than the baseline cover (0.8 m cover), which was 360 $\mu\text{S}/\text{cm}$ between 20-40 cm bgl. Between 0-30 cm bgl, EC was comparable to the baseline cover (0.8 m cover). Therefore, 0.2 m of the base of the cover shows evidence of capillary rise of salts which may inhibit plant growth. Notwithstanding, 0.4 m of the cover is available for plant growth. That is, it unlikely to restrict plant growth from the build up of salts in the root zone. However, the extent of the capillary rise and the need for a capillary break layer in the cover is not conclusive at this stage. The 0.6 and 0.8 m covers should be monitored in the steel column trials to assess the risk of salt build up through capillary rise.

4.2 Metal leaching

ASLP testing was done to determine the risk of metal leaching by rainfall from the tailings into the covers. Al, Fe, Pb and Mn were slightly elevated at the top of the 0.4 and 0.6 m covers. Cd, Co, Mn, Ni and Zn were slightly elevated at the base of the 0.4 and 0.6 m covers. All other metal / metalloid concentrations were low and / or similar to the baseline cover (0.8 m cover).

The solubility of many metals is pH dependent. The 0.4 m cover is neutral between 0-30 cm bgl and acidic at the base between 30-40 cm bgl (pH 5.5) (Figure 2). Tailings in the 0.4 m cover (40-90 cm bgl) was strongly acidic (pH 4.4-4.6). The 0.6 m cover was also neutral between 0-50 cm bgl (pH 6.6-7.1) and acidic at the base between 50-60 cm bgl (pH 5.6). Tailings in the 0.6 m cover was strongly acidic (pH 3.5). The pH of the baseline cover was neutral ranging from 6.8-7.0. The pH results show that there is acidity at the base (bottom 10 cm) of each cover which indicates that acidic pore water is rising (capillarity) from the tailings into the cover.

It is important to note the ASLP test was done using deionised water (neutral pH) and that should acidic conditions occur (eg as a result of acid mine drainage (AMD) or dissolution of stored acidity), much higher concentrations of dissolved metals are possible. Therefore, if AMD, neutral mine drainage (NMD) or saline drainage (SD) forms at the Mine, it may contain elevated Al, Fe, Pb and Mn.

5.0 Conclusions and recommendations

There is evidence of capillary rise of salts, acidity and some metals / metalloids in both the 0.4 and 0.6 m covers. The 0.4 m cover is considered likely to fail because capillarity will limit plant growth. Noting that the 0.4 m cover has been disbanded as a preferred cover based on its performance in the IBC trials and was not recommissioned



in the steel column trials. EC was elevated at the base of the 0.6 m cover making 0.4 m available to support plant growth. Notwithstanding, the need for a capillary break layer in the cover is inconclusive at this stage.

It is recommended that the Mine monitors the 0.6 and 0.8 m covers in the steel column trials for capillary rise of salts, acidity, metals and metalloids.

Yours sincerely



Timothy Rohde
Director
trohde@sgmenvironmental.com



Appendix A

Field testing results



Table 2 Field testing — 0.4 m cover

Depth / layer	Sample	pH (pH units)	EC ($\mu\text{S}/\text{cm}$)
0-10 cm bgl / soil	1	5.95	214.7
	2	5.82	555.8
	3	5.95	136.6
10-20 cm bgl / soil	1	5.69	433.9
	2	5.65	1287
	3	5.69	246.2
20-30 cm bgl / soil	1	5.71	528.8
	2	5.58	880.4
	3	5.56	583.1
30-40 cm bgl / soil	1	5.39	932.2
	2	4.94	977.8
	3	4.92	905
40-60 cm bgl / tailings	1	4.22	989.6
	2	4.38	1,435
	3	4.79	1,129
70-90 cm bgl / tailings	1	4.76	1,513
	2	4.98	1,966
	3	4.66	1,467

Table 3 Field testing — 0.6 m cover

Depth / layer	Sample	pH (pH units)	EC ($\mu\text{S}/\text{cm}$)
0-10 cm bgl / soil	1	5.78	166.4
	2	6.15	226.8
	3	5.74	88.3
10-20 cm bgl / soil	1	6.02	138.2
	2	5.67	187.1
	3	5.65	114.2
20-30 cm bgl / soil	1	5.84	237



Depth / layer	Sample	pH (pH units)	EC (µS/cm)
	2	5.97	263.8
	3	6.38	72.48
30-40 cm bgl / soil	1	5.78	438.5
	2	5.61	574.9
	3	5.69	412.7
40-50 cm bgl / soil	1	5.78	720.7
	2	5.43	1,391
	3	5.54	1,164
50-60 cm bgl / soil	1	5.01	1,840
	2	5.24	1,350
	3	5.46	2,157
60-80 cm bgl / tailings	1	3.32	2,452
	2	3.6	1,584
	3	4.16	1,047

Table 4 Field testing — 0.8 m cover

Depth	Sample	pH	EC
0-20 cm bgl / soil	1	5.85	97.7
	2	6.06	92.06
	3	5.91	190.8
20-40 cm bgl / soil	1	5.51	177.7
	2	5.71	191.6
	3	5.48	259.9
40-60 cm bgl / soil	1	5.52	673.1
	2	5.39	156.7
	3	5.82	227.9
60-80 cm bgl / soil	1	5.8	411.4
	2	5.2	171.1
	3	5.93	220.1



Appendix B

Certificate of analysis



CLIENT DETAILS

Contact Timothy Rohde
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Project **18009 Hera Mine**
 Order Number (Not specified)
 Samples 17

LABORATORY DETAILS

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SGS Reference **CE149928 R0**
 Date Received 15 Dec 2020
 Date Reported 07 Jan 2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(3146/19038)

SIGNATORIES



Anthony NILSSON
 Operations Manager



Jon Dicker
 Manager Northern QLD

Parameter	Units	LOR	CE149928.001	CE149928.002	CE149928.003	CE149928.004
Sample Number			CE149928.001	CE149928.002	CE149928.003	CE149928.004
Sample Matrix			Soil	Soil	Soil	Soil
Sample Name			0.4 m cover 0-10	0.4 m cover 10-20	0.4 m cover 20-30	0.4 m cover 30-40

ASLP (Australian Standard Leaching Procedure) DI Water Method: AN007/AS4439.3 Tested: 21/12/2020

Mass of test sample for extraction	g	-	100	100	100	100
Mass of leaching solution used	g	-	200	200	200	200
Leaching solution used*	No unit	-	DIH2O	DIH2O	DIH2O	DIH2O
pH of solids leachate	pH Units	-	6.7	6.7	6.6	5.5
Conductivity @25C	µS/cm	1	470	540	920	1500

Metals in ASLP DI Extract by ICPOES Method: AN320 Tested: 24/12/2020

Aluminium, Al	mg/L	0.005	0.099	0.021	0.022	0.042
Barium, Ba	mg/L	0.005	0.049	0.058	0.055	0.044
Iron, Fe	mg/L	0.005	0.047	0.006	<0.005	<0.005
Manganese, Mn	mg/L	0.005	0.052	0.010	0.12	10
Zinc, Zn	mg/L	0.005	<0.005	<0.005	0.17	44

Metals in ASLP DI Water Extract by ICPOES-USN Method: AN320/AN322 Tested: 24/12/2020

Arsenic, As	mg/L	0.003	<0.003	<0.003	<0.003	<0.003
Beryllium, Be	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium, Cd	mg/L	0.0001	<0.0001	<0.0001	0.0004	0.090
Copper, Cu	mg/L	0.001	0.002	0.001	0.001	0.002
Chromium, Cr	mg/L	0.001	<0.001	<0.001	<0.001	0.001
Cobalt, Co	mg/L	0.001	<0.001	<0.001	<0.001	0.11
Lead, Pb	mg/L	0.001	0.002	0.001	<0.001	0.002
Molybdenum, Mo	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Nickel, Ni	mg/L	0.001	0.001	<0.001	0.002	0.25

Mercury in ASLP DI Water Extract Method: AN311(Perth) /AN312 Tested: 21/12/2020

Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
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Parameter	Units	LOR	CE149928.005 Soil 0.4 m cover 40-60	CE149928.006 Soil 0.4 m cover 70-90	CE149928.007 Soil 0.6 m cover 0-10	CE149928.008 Soil 0.6 m cover 10-20
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ASLP (Australian Standard Leaching Procedure) DI Water Method: AN007/AS4439.3 Tested: 21/12/2020

Mass of test sample for extraction	g	-	100	100	100	100
Mass of leaching solution used	g	-	200	200	200	200
Leaching solution used*	No unit	-	DIH2O	DIH2O	DIH2O	DIH2O
pH of solids leachate	pH Units	-	4.4	4.6	7.1	6.8
Conductivity @25C	µS/cm	1	1900	2500	180	290

Metals in ASLP DI Extract by ICPOES Method: AN320 Tested: 24/12/2020

Aluminium, Al	mg/L	0.005	1.3	0.77	1.8	0.021
Barium, Ba	mg/L	0.005	<0.005	<0.005	0.021	0.033
Iron, Fe	mg/L	0.005	5.3	4.0	0.76	0.009
Manganese, Mn	mg/L	0.005	10	18	0.047	0.016
Zinc, Zn	mg/L	0.005	160	230	0.029	0.008

Metals in ASLP DI Water Extract by ICPOES-USN Method: AN320/AN322 Tested: 24/12/2020

Arsenic, As	mg/L	0.003	0.022	0.022	<0.003	<0.003
Beryllium, Be	mg/L	0.0001	0.0025	0.0011	0.0001	<0.0001
Cadmium, Cd	mg/L	0.0001	0.71	1.1	0.0001	<0.0001
Copper, Cu	mg/L	0.001	0.069	0.021	0.006	0.003
Chromium, Cr	mg/L	0.001	0.001	0.002	0.001	<0.001
Cobalt, Co	mg/L	0.001	0.63	1.0	0.001	<0.001
Lead, Pb	mg/L	0.001	3.0	3.0	0.011	<0.001
Molybdenum, Mo	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Nickel, Ni	mg/L	0.001	1.3	2.3	0.002	0.001

Mercury in ASLP DI Water Extract Method: AN311(Perth) /AN312 Tested: 21/12/2020

Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
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Parameter	Units	LOR	CE149928.009 Soil 0.6 m cover 20-30	CE149928.010 Soil 0.6 m cover 30-40	CE149928.011 Soil 0.6 m cover 40-50	CE149928.012 Soil 0.6 m cover 50-60
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ASLP (Australian Standard Leaching Procedure) DI Water Method: AN007/AS4439.3 Tested: 21/12/2020

Mass of test sample for extraction	g	-	100	100	100	100
Mass of leaching solution used	g	-	200	200	200	200
Leaching solution used*	No unit	-	DIH2O	DIH2O	DIH2O	DIH2O
pH of solids leachate	pH Units	-	6.7	6.7	6.6	5.6
Conductivity @25C	µS/cm	1	300	660	1500	2900

Metals in ASLP DI Extract by ICPOES Method: AN320 Tested: 24/12/2020

Aluminium, Al	mg/L	0.005	0.027	0.017	0.047	0.050
Barium, Ba	mg/L	0.005	0.034	0.070	0.052	0.049
Iron, Fe	mg/L	0.005	0.010	<0.005	0.010	<0.005
Manganese, Mn	mg/L	0.005	0.038	0.10	1.2	29
Zinc, Zn	mg/L	0.005	0.006	<0.005	0.18	120

Metals in ASLP DI Water Extract by ICPOES-USN Method: AN320/AN322 Tested: 24/12/2020

Arsenic, As	mg/L	0.003	<0.003	<0.003	<0.003	0.003
Beryllium, Be	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium, Cd	mg/L	0.0001	<0.0001	<0.0001	0.0004	0.20
Copper, Cu	mg/L	0.001	0.002	0.002	0.002	0.003
Chromium, Cr	mg/L	0.001	<0.001	<0.001	<0.001	0.001
Cobalt, Co	mg/L	0.001	<0.001	<0.001	0.002	0.33
Lead, Pb	mg/L	0.001	<0.001	0.001	0.001	0.005
Molybdenum, Mo	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
Nickel, Ni	mg/L	0.001	0.001	0.001	0.003	0.66

Mercury in ASLP DI Water Extract Method: AN311(Perth) /AN312 Tested: 21/12/2020

Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
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Parameter	Units	LOR	CE149928.013 Soil 0.6 m cover 60-80	CE149928.014 Soil 0.8 m cover 0-20	CE149928.015 Soil 0.8 m cover 20-40	CE149928.016 Soil 0.8 m cover 40-60
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ASLP (Australian Standard Leaching Procedure) DI Water Method: AN007/AS4439.3 Tested: 21/12/2020

Mass of test sample for extraction	g	-	100	100	100	100
Mass of leaching solution used	g	-	200	200	200	200
Leaching solution used*	No unit	-	DIH2O	DIH2O	DIH2O	DIH2O
pH of solids leachate	pH Units	-	3.5	6.8	7.0	6.9
Conductivity @25C	µS/cm	1	2700	230	360	390

Metals in ASLP DI Extract by ICPOES Method: AN320 Tested: 24/12/2020

Aluminium, Al	mg/L	0.005	130	0.031	0.051	0.014
Barium, Ba	mg/L	0.005	<0.005	0.043	0.052	0.053
Iron, Fe	mg/L	0.005	100	0.017	0.024	<0.005
Manganese, Mn	mg/L	0.005	16	0.026	0.042	0.031
Zinc, Zn	mg/L	0.005	310	0.070	0.062	0.078

Metals in ASLP DI Water Extract by ICPOES-USN Method: AN320/AN322 Tested: 24/12/2020

Arsenic, As	mg/L	0.003	0.075	<0.003	<0.003	<0.003
Beryllium, Be	mg/L	0.0001	0.025	<0.0001	<0.0001	<0.0001
Cadmium, Cd	mg/L	0.0001	1.2	0.0004	0.0003	0.0004
Copper, Cu	mg/L	0.001	2.0	0.004	0.005	0.003
Chromium, Cr	mg/L	0.001	0.029	<0.001	<0.001	<0.001
Cobalt, Co	mg/L	0.001	0.95	<0.001	<0.001	<0.001
Lead, Pb	mg/L	0.001	2.1	0.001	0.001	0.001
Molybdenum, Mo	mg/L	0.001	0.002	<0.001	<0.001	<0.001
Nickel, Ni	mg/L	0.001	1.8	0.002	0.002	0.002

Mercury in ASLP DI Water Extract Method: AN311(Perth) /AN312 Tested: 21/12/2020

Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
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Sample Number	CE149928.017
Sample Matrix	Soil
Sample Name	0.8 m cover 60-80
Parameter	Units LOR

ASLP (Australian Standard Leaching Procedure) DI Water Method: AN007/AS4439.3 Tested: 21/12/2020

Mass of test sample for extraction	g	-	100
Mass of leaching solution used	g	-	200
Leaching solution used*	No unit	-	DIH ₂ O
pH of solids leachate	pH Units	-	6.8
Conductivity @25C	µS/cm	1	310

Metals in ASLP DI Extract by ICPOES Method: AN320 Tested: 24/12/2020

Aluminium, Al	mg/L	0.005	0.024
Barium, Ba	mg/L	0.005	0.049
Iron, Fe	mg/L	0.005	0.009
Manganese, Mn	mg/L	0.005	0.030
Zinc, Zn	mg/L	0.005	0.10

Metals in ASLP DI Water Extract by ICPOES-USN Method: AN320/AN322 Tested: 24/12/2020

Arsenic, As	mg/L	0.003	<0.003
Beryllium, Be	mg/L	0.0001	<0.0001
Cadmium, Cd	mg/L	0.0001	0.0005
Copper, Cu	mg/L	0.001	0.004
Chromium, Cr	mg/L	0.001	<0.001
Cobalt, Co	mg/L	0.001	<0.001
Lead, Pb	mg/L	0.001	0.001
Molybdenum, Mo	mg/L	0.001	<0.001
Nickel, Ni	mg/L	0.001	0.002

Mercury in ASLP DI Water Extract Method: AN311(Perth) /AN312 Tested: 21/12/2020

Mercury	mg/L	0.0001	<0.0001
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MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in ASLP DI Water Extract Method: ME-(AU)-[ENV]AN311(Perth) /AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Mercury	LB085230	mg/L	0.0001	<0.0001	0 - 11%	102%

Metals in ASLP DI Extract by ICPOES Method: ME-(AU)-[ENV]AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Aluminium, Al	LB085311	mg/L	0.005	<0.005	0 - 3%	100%	NA
Barium, Ba	LB085311	mg/L	0.005	<0.005	0 - 1%	99%	NA
Iron, Fe	LB085311	mg/L	0.005	<0.005	0%	98%	NA
Manganese, Mn	LB085311	mg/L	0.005	<0.005	0 - 1%	102%	NA
Zinc, Zn	LB085311	mg/L	0.005	<0.005	0%	101%	NA

Metals in ASLP DI Water Extract by ICPOES-USN Method: ME-(AU)-[ENV]AN320/AN322

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arsenic, As	LB085312	mg/L	0.003	<0.003	0%	115%
Beryllium, Be	LB085312	mg/L	0.0001	<0.0001	0%	114%
Cadmium, Cd	LB085312	mg/L	0.0001	<0.0001	0 - 6%	114%
Copper, Cu	LB085312	mg/L	0.001	<0.001	0 - 1%	107%
Chromium, Cr	LB085312	mg/L	0.001	<0.001	2 - 3%	112%
Cobalt, Co	LB085312	mg/L	0.001	<0.001	0%	109%
Lead, Pb	LB085312	mg/L	0.001	<0.001	0%	107%
Molybdenum, Mo	LB085312	mg/L	0.001	<0.001	0%	106%
Nickel, Ni	LB085312	mg/L	0.001	<0.001	0 - 1%	114%

METHOD

METHODOLOGY SUMMARY

AN007/AS4439.3

Contaminants of interest in a waste material are leached out of the waste with a selected leaching solution under controlled conditions. The ratio of sample to extraction fluid is 100 g to 2 L (1 to 20 by mass). The concentration of each contaminant of interest is determined in the leachate by appropriate methods after separation from the sample by filtering. Based on AS4439.3.

AN311(Perth) /AN312

Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.

AN318

Determination of elements at trace level in waters by ICP-MS technique, referenced to USEPA 6020B and USEPA 200.8 (5.4).

AN320

Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .

AN320

Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements. Reference APHA 3120 B.

AN320/322

Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements. Reference APHA 3120 B

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
***	Indicates that both * and ** apply.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received. Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- a. 1 Bq is equivalent to 27 pCi
- b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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