AIR QUALITY AND GREENHOUSE GAS MANAGEMENT PLAN

HERA MINE AND FEDERATION MINE

12/05/2025

aurelia METALS

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Version	Date	Description	Author
V1.0	07/12/2023	New Management Plan for submission to DPE	Todoroski Air Sciences / IEMA
V1.1	12/05/2025	Modification 2 Updates	IEMA and Aurelia

1. INTRODUCTION

1.1. Background

Hera Resources Pty Ltd (Hera Resources), a wholly owned subsidiary of Aurelia Metals Limited (Aurelia), owns and maintains Hera Mine, an underground metalliferous mine, approximately 100km southeast of Cobar and 4km south of Nymagee in the central west of New South Wales (NSW). Hera Resources operated Hera Mine from 2014 until it entered care and maintenance in early 2023.

Hera Mine is a State Significant Development (SSD) and commenced operations in 2012 under the former *Environmental Planning and Assessment Act 1979* (EP&A Act) Part 3A Major Project Approval development consent MP10_0191, which has been modified six times.

The Federation Project (the Project) is an underground metalliferous mine located in central-western NSW, approximately 15 kilometres (km) south of the Nymagee township and 10km south of Hera Mine. High grade mineral deposits were discovered at the Federation Mine site in 2019 with subsequent drilling operations identifying a substantial gold-lead-zinc-copper-silver mineral resource.

Following the mineral discovery, an Exploration Decline Program was approved for a bulk sample and supporting infrastructure at the Federation Site in August 2021 by the Resources Regulator under Part 5 of the EP&A Act and section 23A(4) of the *Mining Act 1992*. Development consent ('the consent') for the Project (SSD 24319456) was granted on 2 March 2023 and has since been modified twice. Modification 1 was approved on 27 November 2023 regarding changes to biodiversity offset staging.

Modification 2 was approved on 27 March 2025 to allow options for:

- haulage between 7am and 10pm of up to 600ktpa of ore to Peak Gold Mine (PMG) for processing, throughout the life of mine;
- reclaim of tailings from the existing Hera Mine Tailings Storage Facility (TSF) for paste backfill at Federation Mine; and
- minor rearrangement of infrastructure at Federation Mine within the approved disturbance area, inclusive of new water tank.

The consent required that 'within 12 months of the date of physical commencement of development under this consent, or other timeframe agreed by the Planning Secretary, the Applicant must surrender development consent MP10_0191 for the Hera Gold Mine. The Hera Gold Mine consent was surrendered on 17 March 2025. The Project's consent includes the amalgamation of Hera Mine's development consent conditions with the consent conditions for the Project into a single consolidated consent for both Hera Mine and Federation Mine as well as connecting infrastructure, herein referred to as the Site. Within the Site, the consent authorises activities within the 'approved disturbance area'.

Key infrastructure for the Site is outlined in **Table 1**.

Table 1: Key Site Infrastructure

Project Element	Description
Mining Method	Underground mining via longitudinal retreat long hole stoping method.
Management of Waste Rock	During operations, waste rock is stored on designated pads or utilised for backfilling underground stopes. Post mining, potentially acid forming waste rock will be returned underground, and non-acid forming waste rock will be returned underground, used for backfilling the box cut or used for other rehabilitation purposes.
Processing Plant	The existing processing plant includes a Run of Mine (ROM) pad, waste rock emplacement (WRE), crushing, grinding and screening operations, gravity separation, and flotation circuits capable of processing up to 505ktpa of ore. The new processing plant is anticipated to be commissioned early to mid-2024 at Hera Mine capable of processing 750ktpa of ore once at full operational capacity. Key elements of the proposed processing plant include: • Three stages of crushing followed by ball milling with hydrocyclone classification. • Gravity separation to recover gold from the milling circuit recirculating load, followed by cyanide leaching of the gravity concentrate. • Sequential flotation to produce separate copper, lead and zinc concentrates. • Concentrate thickening and filtration. Tailings thickening and filtration, and disposal by both underground paste backfill at Federation Site and surface storage in the approved Hera Mine TSF.
Management of Tailings	Tailings will be either placed into the approved Tailings Storage Facility at Hera Mine or returned to Federation Mine for placement underground as paste backfill. The preferred backfill method at Federation Mine is cemented paste fill using tailings. The tailings paste plant will be located adjacent to the stoping footprint to allow gravity reticulation of tailings paste fill down dedicated boreholes and laterally through an underground paste distribution system. The shotcrete batch plant will be co-located with the tailings paste fill plant. This plant will provide an ongoing supply of shotcrete for ground support requirements underground and concrete for miscellaneous construction works.
Power Generation	The preferred option for power generation at Federation Mine will be by a gas plant at Hera Mine with power transferred by overhead powerlines. A proposed solar farm to be constructed at Hera Mine will offset gas requirements. An option for a solar farm and gas generators at Federation Mine is also being considered if separate power generation is the preferred option in which case transmission lines will not be required. The Federation Mine will initially be powered by diesel generators while new power generation capacity is constructed.
General Infrastructure	Internal roads, ablutions block, administration buildings, workshop and stores, sewage treatment and treated effluent irrigation, diesel storage tanks, potable water treatment, waste rock storage, underground vents, sub station, paste plant, laydown area, topsoil stockpiles, ROM pad, box cut, magazines, haul roads, telecommunications tower, surface extraction areas, ventilation rises, access roads, heavy vehicle corridors, overhead transmission lines and concentrate stores.
Transport	Ore will be transported from Federation Mine to Hera Mine via Burthong Road and to Peak Mine via Priory Tank Road and Kidman Way. Tailings will be transported from Hera Mine to Federation Mine via Burthong Road. Concentrate will be transported via road from Hera Mine to Hermidale Siding with an average of approximately 12 vehicle trips per day at the peak of concentrate transport. At the peak of mining, concentrate, ore, and tailings transport is estimated to be an average of 61 vehicle trips (one-way movements) per day.
Water Management	The processing plants generate the majority of the Site's water demand. Water will primarily be sourced from underground workings and pumped to the surface. A network of production bores will also be established which will supplement the existing production bores.

	The maximum groundwater extraction forecast by the site water balance model is 530 megalitres per year (ML/year), which is within the existing licenced volume of 543 ML/year. **Hera Mine** The water management system at the Hera Site includes the diversion of clean water runoff around upslope areas of the site, the collection of water from disturbed areas and the discharge of water to Box Creek. The key elements of the Hera water management system include: • Clean water runoff from undisturbed catchment areas within and upslope of the site. These flows may be diverted and discharged off site without treatment or licensing. • The dirty water management system which consists of a series of dirty water drains. Sediment Basin 1 and Sediment Basin 2 were used as dirty water storages during construction and have since been combined into a larger contaminated water storage which collects runoff from the processing plant area. • Raw water system supplied from production bores around the site. The production bores transfer water to the Back Tank (located beside Back Dam). Water from the Back Tank is transferred to the Feed Water Tank. The House Dam receives surface water from the clean water catchment and the House Bore (production bore). **Federation Mine** A water management system will be implemented at the Federation Mine. Key elements include the diversion of clean water runoff around the mine, and the collection of water from disturbed areas and the underground. Dirty (sediment) water is captured in catch drains and collected in the sediment basin within the footprint of the Stormwater Retention Pond. Runoff from the PAF pads will drain to lined leach ponds. Runoff from the box cut will report down the decline and be dewatered as part of the underground dewatering system to the Dewater Pond. Water contained in the lined leach ponds, Stormwater Retention Pond and Dewater Pond will be recirculated for reuse within the Hera Mine water management system by the water pipeline between Federation Mine and Hera Mine.
Services Corridor	Linear infrastructure in the 23m wide, 14.3km long services corridor (see **Figure 2**) includes: • Electricity transmission lines (if required) • Water pipeline • Access track • Tailings pipeline and return water line (potentially) • Communication infrastructure (potentially).

Ore from Federation Mine will be trucked to the Peak Mine during the first four years of operations. Federation Mine is expected to produce up to 6.95 million tonnes of ore over a 12 to 14 year period.

The regional locality of the Site is shown in **Figure 1** and a general site layout is in **Figure 2**. Detailed layouts of Hera Mine and Federation Mine are shown in **Figure 3** and **Figure 4** respectively.

1.2. Purpose and Scope

This Air Quality and Greenhouse Gas Management Plan (AQGHGMP) has been prepared in accordance with Condition B25 of SSD 23419456 to manage the air quality and greenhouse gas impacts of the Site. This Air Quality and Greenhouse Gas Management Plan has been prepared by Todoroski Air Sciences on behalf of Hera Resources. Todoroski Air Sciences is a specialist air quality and environmental consultancy whose personnel are members of the Clean Air Society of Australia and New Zealand.

The key objective of the AQGHGMP is to ensure that any air quality impacts are minimised and managed appropriately.

An Air Quality and Greenhouse Gas Assessment (AQGHGA) (Todoroski, 2024) was prepared to support the Modification 2 report. The AQGHGA found that the change in total annual dust emissions associated with the tailings recovery activities and increased haulage to PGM are not expected to result in a tangible change to the total dust generated compared to the originally approved project. The tailings material extracted from the Hera TSF would contain a small amount of heavy metals, however, as a negligible change in dust emissions is predicted, there would also be a corresponding negligible change in heavy metals contained in the dust. Risks to human health associated with metals in dust emissions are considered negligible for inhalation exposures and multi-pathway exposures.

The greenhouse gas assessment identified that the Modification would result in an approximate 48.1% reduction in Scope 1 greenhouse gas emissions relative to the Approved Project. The decrease in Scope 1 emissions primarily arises due to the reduced LNG requirements for power generation associated with the processing of ore at Hera Mine.

The AQGHGA did not recommend any additional mitigation measures be introduced to this AQGHGMP.

370000 380000 390000 400000 410000 420000 430000 440000 450000 460000 470000 480000 490000 500000 510000

6490000 6480000 6470000 6460000 6450000 6440000 6430000 6420000 6410000 6400000 6390000

YANDA CREEK
ROSEVALE ROAD
WHITBARROW CREEK
HERMIDALE NYMAGEE ROAD
PANGEE CREEK
BOGAN RIVER
YARRAN CREEK
HONEYBUGLE
CREEPER GATE
BABINDA
BOGAN SHIRE COUNCIL
PANGEE
SANDY CREEK
PRIORY TANK ROAD
BOX CREEK
WHITBARROW WAY
NYMAGEE
COBAR SHIRE COUNCIL
SHUTTLETON
Hera Site
BALOWRA ROAD
BULLOCK CREEK
FIVE WAYS
KIDMAN WAY
GLENWOOD ROAD
Federation Site
SANDY CREEK
MIDDLE CREEK
MOOTHUMBOOL CREEK
BOBADAH
MIAMLEY
THULE CREEK
GILGUNNIA
BURTHONG CREEK
EREMERANG
LACHLAN SHIRE COUNCIL
HENRY PARKES WAY
MINERAL HILL
ALBERT ROAD
KEREIN HILLS
MAROBEE CREEK

LEGEND

- Site
- Local Government Area
- Major Roads
- Watercourse
- State Forest
- NPWS Reserve

0 3,000 6,000 9,000 12,000 m

Scale: 1:450,000

GCS WGS 1984
22/02/2023

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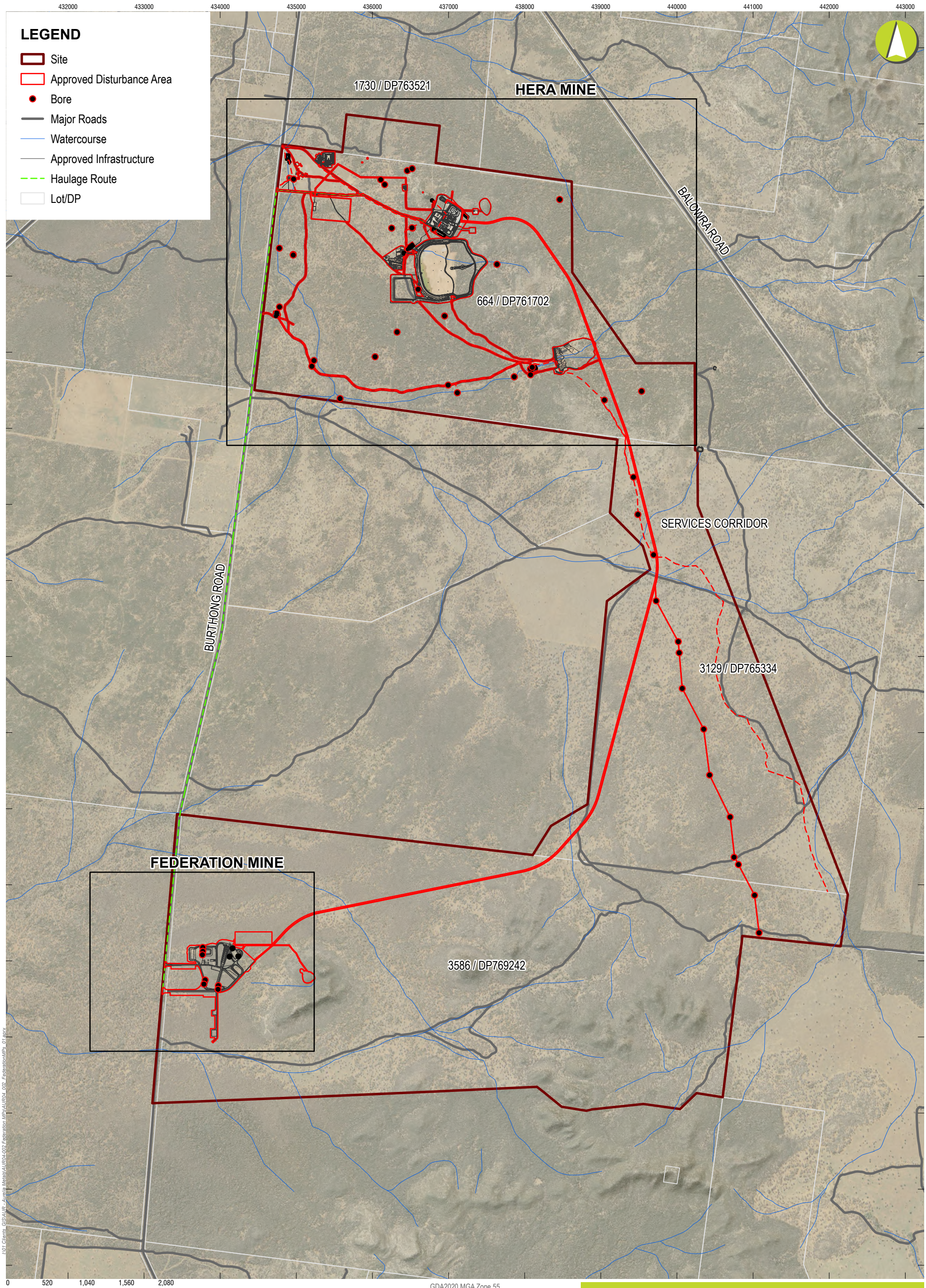
Aurelia Minerals - Federation MP

Regional Locality

FIGURE 1


LEGEND
Site
Approved Disturbance Area
Bore
Major Roads
Watercourse
Approved Infrastructure
Haulage Route
Lot/DP
HERA MINE
FEDERATION MINE
1730 / DP763521
664 / DP761702
3129 / DP765334
3586 / DP769242
BALOWRA ROAD
BURTHONG ROAD
SERVICES CORRIDOR
432000
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GDA2020 MGA Zone 55
24/02/2023
Aurelia Metals - SSD 24319456
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Site
FIGURE 2

433000 434000 435000 436000 437000 438000 439000 440000 441000

6448000 6447000 6446000 6445000 6444000 6443000

GLENWOOD ROAD

BURTHONG ROAD

EXISTING AND EXPANDED ACCOMMODATION VILLAGE

PROPOSED OVERHEAD TRANSMISSION LINE

MAIN SITE ENTRANCE

EXISTING OVERHEAD TRANSMISSION LINE

SWITCH GEAR

GENSETS

PROPOSED SOLAR FARM

WB5

EXISTING PROCESS PLANT

PROPOSED HV CORRIDOR

QUARRY LOCATION (MOD 6)

STOCKPILE AREA

NEW PROCESS PLANT

SERVICES CORRIDOR

WB10

TAILINGS AND CONCENTRATE SHED

WB13

WB14

SETTLING PONDS

SEDIMENT BASIN

RELOCATED MAGAZINE

APPROVED MINE SITE INFRASTRUCTURE

WATER MANAGEMENT DAM

TSF

WB16

WB20

WB12

WB27

EXTENDED PETE'S DAM

WB25

WB24

WB26

WB11

WB21

WB18

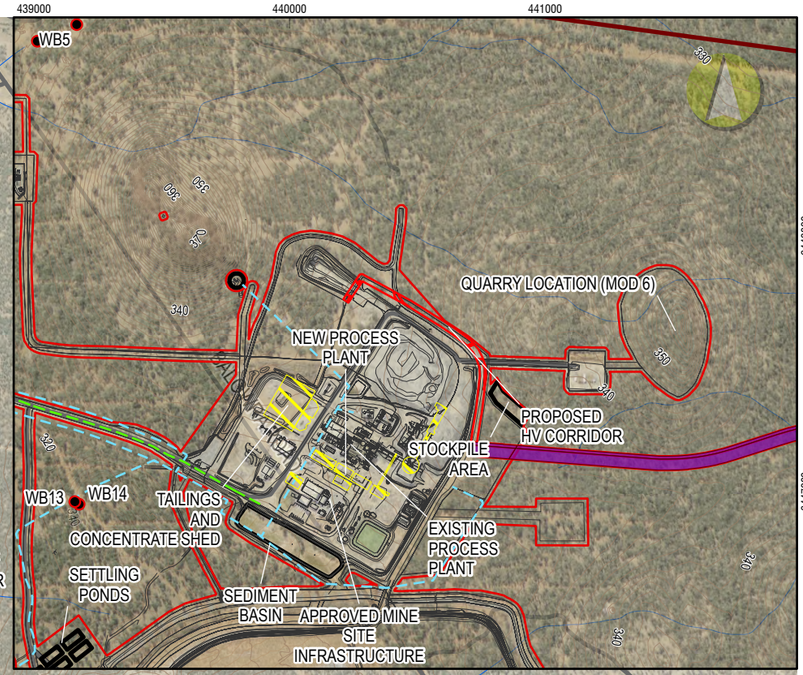
WB8

BACK DAM EAST

BACK DAM WEST

WB4

WB28



LEGEND

- Site
- Approved Disturbance Area
- Bore
- Major Roads
- Watercourse
- Contours
- Approved Infrastructure
- Haulage Route
- Existing Pipeline
- Proposed Processing Plant
- Service Corridor

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Scale: 1:24,000

GDA2020 MGA Zone 55

24/02/2023

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Aurelia Metals - SSD 24319456

Hera Mine

FIGURE 3

433000 433500 434000 434500 435000 435500

6437500

6437000

6436500

6436000

SERVICES CORRIDOR TO HERA MINE

RAW WATER TANK

PASTE PLANT AND SUBSTATION PAD

DEWATER POND

PROPOSED SOLAR FARM

WORKSHOP

TOPSOIL STOCKPILE

STORMWATER RETENTION POND

ACCESS ROAD

OFFICES AND ABLUTIONS

TOPSOIL STOCKPILE

BURTHONG ROAD

ACCESS ROAD

LAYDOWN

TOPSOIL STOCKPILE

PAF WASTE ROCK

CRUSHER PAD

SURFACE EXTRACTION AREA

LINED LEACH POND

ROM ORE STOCKPILE

HV HAUL ROAD

TOPSOIL STOCKPILE

PAF / NAF WASTE ROCK PAD

TOPSOIL STOCKPILE

LINED LEACH POND

MAGAZINE 1

MAGAZINE 2

LEGEND

- Site
- Approved Disturbance Area
- Bore
- Major Roads
- Watercourse
- Approved Infrastructure
- Haulage Route
- Stopping Footprint
- Service Corridor
- Federation Access Roads

0 60 120 180 240 m

Scale: 1:8,000

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GDA2020 MGA Zone 55

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Aurelia Metals - SSD 24319456

Federation Mine

FIGURE 4

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2. LEGAL AND OTHER REQUIREMENTS

2.1.SSD 23419456

SSD 23419456 stipulates the required criteria that the construction and operational activities at the Site must comply with and sets out the core requirements of this AQGHGMP. Relevant conditions associated with this approval and where they have been addressed in this document are reproduced in **Table 2.**

Table 2: Relevant SSD 23419456 Conditions

<table>
<tr><th>Condition No.</th><th>Condition</th><th>Where Addressed</th></tr>
<tr><td colspan="3">AIR QUALITY AND GREENHOUSE GAS</td></tr>
<tr><td colspan="3">Odour</td></tr>
<tr><td>B21</td><td>The Applicant must ensure that no offensive odours, as defined under the POEO Act, are emitted from the development.</td><td>Section 4.1</td></tr>
<tr><td colspan="3">Air Quality Criteria</td></tr>
<tr><td>B22</td><td>The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria listed in Table 3 at any residence on privately-owned land.
Table 3: Air Quality Criteria
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th>Criterion</th></tr>
<tr><td rowspan="2">Particulate matter < 10 µm (PM_{10})</td><td>Annual</td><td>[a, c] 25 µg/m^3</td></tr>
<tr><td>24 hour</td><td>[b] 50 µg/m^3</td></tr>
<tr><td rowspan="2">Particulate matter < 2.5 µm ($PM_{2.5}$)</td><td>Annual</td><td>[a, c] 8 µg/m^3</td></tr>
<tr><td>24 hour</td><td>[b] 25 µg/m^3</td></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>[a, c] 90 µg/m^3</td></tr>
</table>
Notes:
[a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
[c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.</td><td>Section 4
Section 5</td></tr>
<tr><td>B23</td><td>The air quality criteria in Table 3 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.</td><td>Noted</td></tr>
<tr><td colspan="3">Air Quality Operating Conditions</td></tr>
<tr><td>B24</td><td>The Applicant must:
(a) take all reasonable steps to
(i) minimise odour, fume, and particulate matter (including PM_{10} and $PM_{2.5}$) emissions of the development, paying particular attention to minimising odour from ventilation shafts, wheel-generated haul road emissions, and emissions from the waste rock emplacements;
(ii) improve energy efficiency and reduce greenhouse gas emissions of the development;
(iii) minimise any visible off-site air pollution generated by the development;</td><td>Section 4</td></tr>
</table>

Condition No.	Condition	Where Addressed
	(iv) minimise to the greatest extent practicable, the area of dust generating surfaces at any given point in time;	
	(b) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting and air quality monitoring to guide the day to day planning of mining operations and the implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent;	Section 4 Section 5.3
	(c) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note c to Table 3 above);	Section 6.1
	(d) carry out regular air quality monitoring to determine whether the development is complying with the relevant conditions of this consent; and	Section 5
	(e) regularly assess the air quality monitoring data and modify operations to ensure compliance with the relevant conditions of this consent.	Section 8
Air Quality and Greenhouse Gas Management Plan		
B25	The Applicant must prepare an Air Quality and Greenhouse Gas Management Plan for the development. This plan must: (a) be prepared by a suitably qualified and experienced person/s;	Section 3
	(b) describe the measures to be implemented to ensure: (i) compliance with the air quality criteria and operating conditions in this consent; (ii) reasonable and feasible measures are being employed to: (iii) minimise the development's air quality impacts; (iv) minimise the development's Scope 1 and 2 greenhouse gas emissions; (v) improve the development's energy efficiency; and (vi) the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;	Section 4 Section 5
	(c) describe the air quality management system in detail; and	Section 5 Section 6 Section 8
	(d) include an air quality monitoring program, undertaken in accordance with the *Approved Methods for Sampling and Analysis of Air Pollutants in NSW (EPA, 2022)* and *Ambient Air Monitoring Guidance Note (EPA, 2022),* or its latest version, that: (i) uses monitors to evaluate the performance of the development against the air quality criteria in this consent and to guide day to day planning of operations; (ii) adequately supports the air quality management system; (iii) includes a protocol for distinguishing the dust emissions of the development from any neighbouring developments; and (iv) includes a protocol for identifying any air quality-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of these events.	Section 5 Section 7
B26	Every three years during the life of mining operations, unless otherwise agreed by the Planning Secretary, the Air Quality and Greenhouse Gas Management Plan must be updated to include the following information in relation to Scope 1 and Scope 2 greenhouse gas emissions: (a) a review of abatement technologies relevant to the development's greenhouse gas emissions;	Section 11.1
	(b) a detailed review of the feasibility of implementing various greenhouse gas abatement options, and economic considerations for the development; and	Section 11.1
	(c) a 3-year action plan to investigate and implement reasonable and feasible measures to minimise greenhouse gas emissions.	Section 11.1
B27	The Applicant must not commence construction until the Air Quality and Greenhouse Gas Management Plan has been prepared and a copy has been provided to the Planning Secretary.	Section 2.3
B28	The Applicant must implement the Air Quality and Greenhouse Gas Management Plan.	Section 3

Condition No.	Condition	Where Addressed
	Note: With the introduction of the EPA's Climate Change Policy and Climate Change Action Plan, the Applicant may be required to prepare and implement a Greenhouse Gas Mitigation Plan and a Climate Change Adaptation Plan in accordance with requirements provided by the EPA. If these plans are required by the EPA, on implementation, they could be referenced to meet the requirements of this condition in relation to greenhouse gas emissions.	
Management Plan Requirements		
C5	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include where relevant: (a) summary of relevant background or baseline data;	Section 4
	(b) details of: (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Section 2 Section 4 Section 5
	(c) any relevant commitments or recommendations identified in the document/s listed in condition A2(c);	Section 2
	(d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 2
	(e) a program to monitor and report on the: (i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to paragraph (d);	Section 5
	(f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 6.1
	(g) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 11
	(h) a protocol for managing and reporting any: (i) incident, non-compliance or exceedance of any impact assessment criterion or performance measure; (ii) complaint; or (iii) failure to comply with other statutory requirements;	Section 7 Section 8
	(i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and	Section 9
	(j) a protocol for periodic review of the plan.	Section 11
	Note: *The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*	

2.2. Environment Protection Licence

Relevant conditions of EPL 20179 to this AQGHGMP and where they are addressed in this plan are provided in **Table 3.**

Table 3: Relevant EPL Conditions

Condition No.	Condition	Where Addressed
L6 Potentially offensive odour		
L6.1	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises. Note: Section 120 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour. No condition of this licence identifies a potentially offensive odour for the purposes of Section 120 of the Protection of the Environment Operations Act 1997.	Section 4.1
O3 Dust		
O3.1	Activities occurring at the premises must be carried out in a manner that will minimise emissions of dust from the premises. All dust control equipment must be operable at all times with the exception of shutdowns required for maintenance. Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.	Section 4.4

2.3. Consultation

This management plan does not require consultation. A copy will be provided to DPE prior to the commencement of construction in accordance with Condition B27.

2.4. Greenhouse Gas and Energy Legislation

Hera Resources will report greenhouse emissions data in accordance with the National Greenhouse and Energy Reporting Act 2007 (NGER Act), including:

- Annual Scope 1 Greenhouse Gas (GHG) emissions. Scope 1 emissions are those that are the direct result of activities at a facility under the operational control of Hera Resources, such as diesel combustion for electricity generation and operation of mobile equipment, liquefied petroleum gas (LPG) combustion for the gold room furnace, and explosives; and,
- Scope 3 (Indirect) emissions. These include the extraction, production and transport of purchased fuels consumed, distribution of product from the site by road haulage, rail transportation, and international shipping.

Assessment and reporting of the above will be conducted in accordance with:

- National Greenhouse and Energy Reporting Regulations 2008; and,
- National Greenhouse and Energy Reporting (Measurement) Determination 2008.

2.5. Clean Energy Act 2011

The Clean Energy Act 2011 establishes a mechanism where corporations controlling facilities with GHG emissions above specified thresholds must purchase carbon units for their direct GHG emissions (i.e. per tonne of CO_2-e emitted). The threshold only applies to GHG emissions from sources covered under the Clean Energy Act 2011, with the threshold being 25 kilotonnes (kt) of Carbon Dioxide (CO_2). Hera Resources acknowledges its obligations to report if it goes over the threshold, as required under the Commonwealth Clean Energy Act 2011.

3. BASELINE ENVIRONMENT

This section describes the existing baseline environment including the climate and meteorology in the area surrounding the Site.

3.1. Local Climatic Conditions

Long-term climatic data from the closest Bureau of Meteorology (BoM) weather station at Cobar MO (Site No. 048027) were analysed to characterise the local climate in the proximity of the Site. Cobar MO is located approximately 90km northwest of the Site.

Table 4 and **Figure 5** present a summary of data from the Cobar MO collected over a 48 to 61 year period for the various meteorological parameters.

The data indicate that January is the hottest month with a mean maximum temperature of 34.5 degrees Celsius (ºC) and July is the coldest month with a mean minimum temperature of 5.1ºC.

Rainfall decreases during the cooler months, with an annual average rainfall of 396.1 millimetres (mm) over 45.7 days. The data indicate that January is the wettest month with an average rainfall of 44.1mm over 4.2 days and September is the driest month with an average rainfall of 25.0mm over 3.7 days.

Relative humidity levels exhibit variability over the day and seasonal fluctuations. Mean 9am relative humidity ranges from 40% in December to 79% in June. Mean 3pm relative humidity levels range from 23% in December to 51% in June.

Wind speeds exhibit seasonal variations with lower wind speeds recorded during the cooler months and higher observations during the warmer months. Mean 9am wind speeds range from 8.3 kilometres per hour (km/h) in June to 14.1km/h in January. Mean 3pm wind speeds range from 10.3km/h in May to 14.7km/h in October.

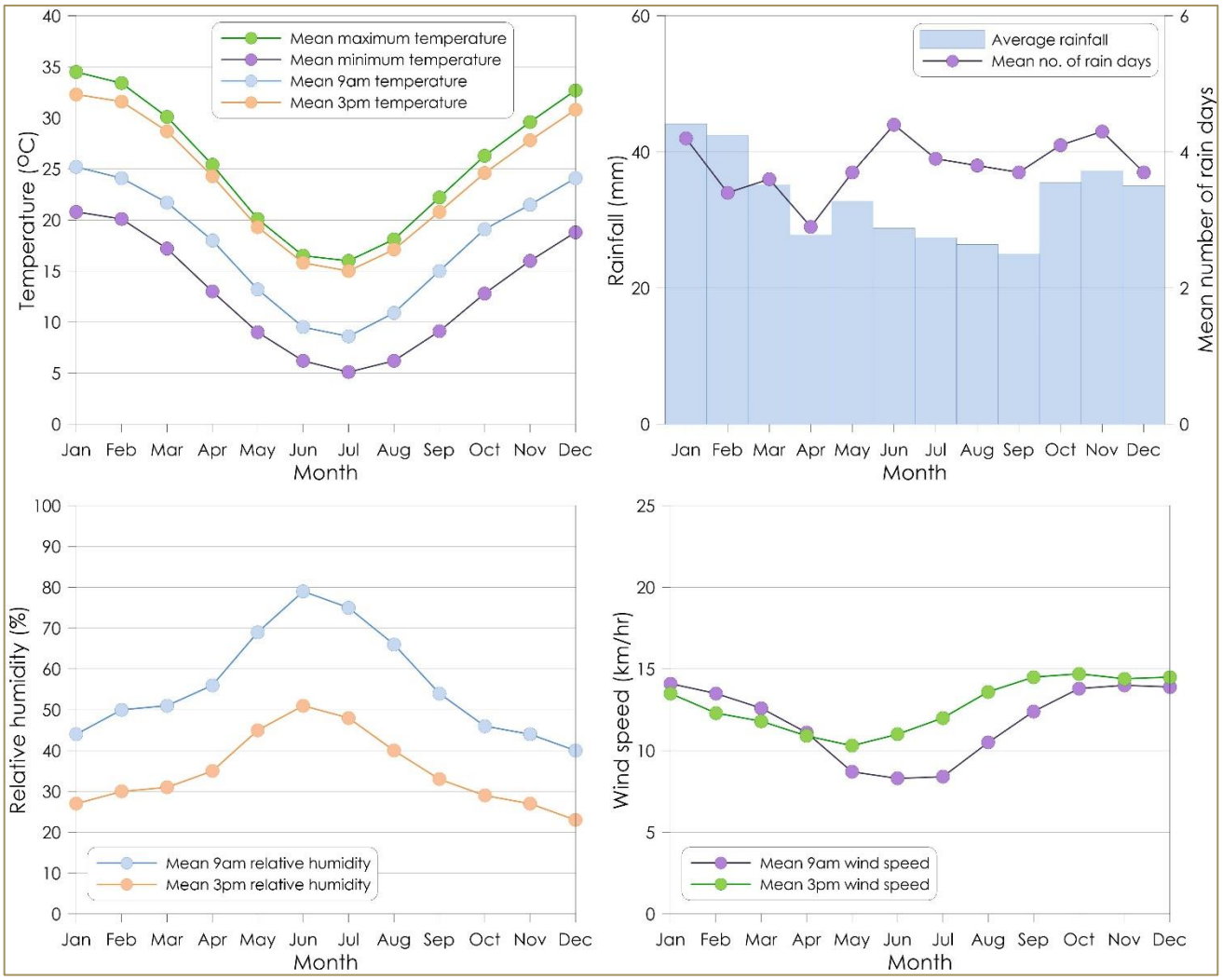
Table 4: Monthly Climate Statistics Summary – Cobar MO

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Temperature													
Mean max. temp. (ºC)	34.5	33.4	30.1	25.4	20.1	16.5	16.0	18.1	22.2	26.3	29.6	32.7	25.4
Mean min. temp. (ºC)	20.8	20.1	17.2	13.0	9.0	6.2	5.1	6.2	9.1	12.8	16.0	18.8	12.9
Rainfall													
Rainfall (mm)	44.1	42.4	35.2	27.8	32.7	28.8	27.4	26.4	25.0	35.5	37.2	35.0	396.1
No. of rain days (≥1mm)	4.2	3.4	3.6	2.9	3.7	4.4	3.9	3.8	3.7	4.1	4.3	3.7	45.7
9am conditions													
Mean temp. (ºC)	25.2	24.1	21.7	18.0	13.2	9.5	8.6	10.9	15.0	19.1	21.5	24.1	17.6
Mean R.H. (%)	44	50	51	56	69	79	75	66	54	46	44	40	56
Mean W.S. (km/h)	14.1	13.5	12.6	11.1	8.7	8.3	8.4	10.5	12.4	13.8	14.0	13.9	11.8
3pm conditions													
Mean temp. (ºC)	32.3	31.6	28.7	24.3	19.3	15.8	15.0	17.1	20.8	24.6	27.8	30.8	24.0
Mean R.H. (%)	27	30	31	35	45	51	48	40	33	29	27	23	35
Mean W.S. (km/h)	13.5	12.3	11.8	10.9	10.3	11.0	12.0	13.6	14.5	14.7	14.4	14.5	12.8

Source: Bureau of Meteorology, 2023

R.H. – Relative Humidity, W.S. – wind speed

Figure 5: Monthly Climate Statistics Summary – Cobar MO

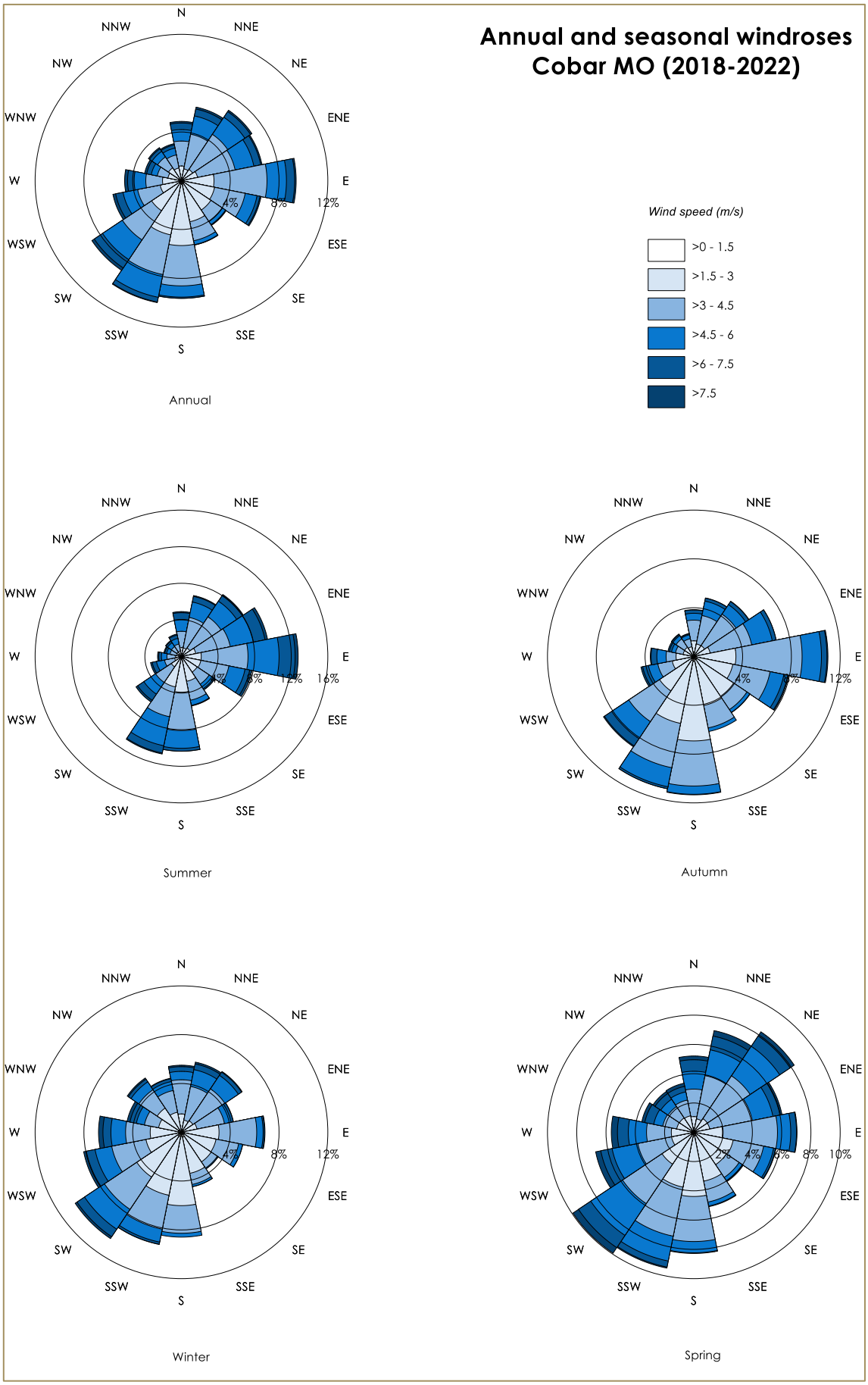


3.2. Local Meteorological Conditions

Annual and seasonal windroses for the Cobar MO for the latest five continuous years of data from 2018 to 2022 are presented in **Figure 6.**

Analysis of the annual windrose shows that wind directions follow a northeast to southwest axis. In summer, winds from the east and south-southwest are most frequent. The autumn windrose shows winds are predominantly from the east and south to southwest. During winter, winds are generally evenly spread with winds greatest from the southwest. The spring windrose follows a similar distribution to the annual windrose with winds along a northeast to southwest axis.

Figure 6: Annual and Seasonal Windroses – Cobar MO (2018-2022)



3.3. Local Air Quality Monitoring

The main sources of air pollutants in the area surrounding the Site would include emissions from active extraction operations and other anthropogenic activities such as various motor vehicle exhaust and domestic wood heaters.

Ambient PM_{10} and $PM_{2.5}$ monitoring data from the nearest air quality monitors operated by the New South Wales (NSW) Department of Planning and Environment (DPE) at Tamworth, Albury, Bathurst, and Wagga Wagga North were used to quantify the background air quality levels in the vicinity of the Site. At Hera Mine, there is a High-Volume Air Sampler (HVAS) which records TSP and PM_{10} concentrations. The HVAS is located within the Hera mining lease and in close proximity to haul roads. There were also eleven dust deposition gauges in use at Hera Mine.

3.3.1. PM_{10} Monitoring – DPE

A summary of the available PM_{10} monitoring data from 2018 to 2022 for the DPE monitoring stations is presented in **Table 5**. Recorded 24-hour average PM_{10} concentrations are presented in **Figure 7.**

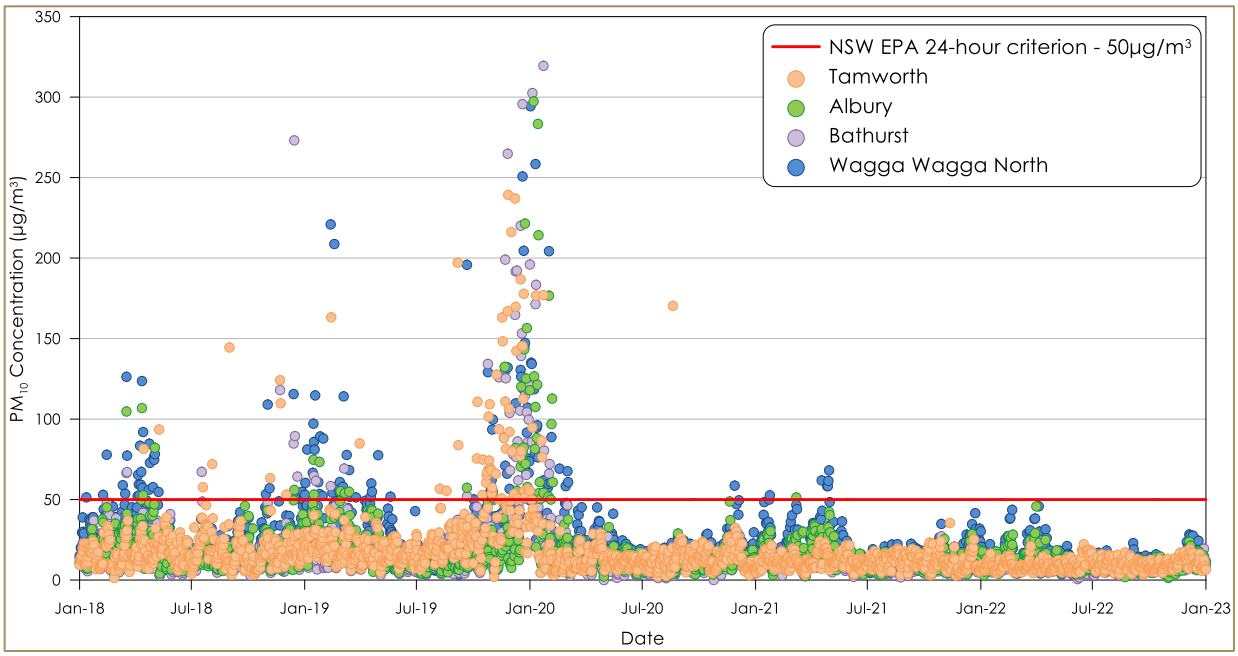
A review of **Table 5** indicates that the annual average PM_{10} concentrations were above the relevant criterion of 25µg/m^3 on occasion during the review period. The maximum 24-hour average PM_{10} concentrations were found to exceed the relevant criterion of 50µg/m^3 for most of the review period, with the exception of 2022 for all monitors.

Figure 7 shows the monitors following similar trends with regional events recorded at all monitoring stations. The high PM_{10} concentration recorded at the monitors from March 2018 to December 2018 is a result of widespread dust storm events (NSW DPIE 2020a). Anomalously high PM_{10} levels from November 2019 to January 2020 is attributed to wildfires and the drought period (NSW DPIE 2019 & NSW DPIE 2020b).

Table 5: Summary of PM_{10} Levels from DPE Monitoring Stations (µg/m^3)

Year	Tamworth	Albury	Bathurst	Wagga Wagga North	Criterion
		Annual average			
2018	20.1	19.8	18.8	**27.4**	**25**
2019	**33.7**	23.4	**27.4**	**35.3**	**25**
2020	16.8	20.1	17.0	23.2	**25**
2021	12.7	14.3	11.3	17.7	**25**
2022	10.6	11.7	8.8	13.1	**25**
Year		Maximum 24-hour average			Criterion
2018	**145.4**	**107.8**	**274.1**	**127.2**	**50**
2019	**240.2**	**222.4**	**296.6**	**251.7**	**50**
2020	**178**	**298.3**	**320.4**	**295.3**	**50**
2021	36.4	**52.3**	29.2	**69.1**	**50**
2022	23.3	46.7	23.2	46.8	**50**

Figure 7: 24-Hour Average PM_{10} Concentrations



3.3.2. PM10 Monitoring – HVAS

A summary of the available PM_{10} monitoring data from 2015 to 2020 for the HVAS monitoring station is presented in **Table 6**.

A review of **Table 6** indicates that the annual average PM_{10} concentrations were above the relevant criterion of 25µg/m^3 during 2015 and 2020.

Table 6: Summary of PM_{10} Levels from HVAS Monitoring Station (µg/m^3)

Year	HVAS Annual average	Criterion
2015	17.1	**25**
2016	15.1	**25**
2017	19.9	**25**
2018	**26.8**	**25**
2019	**30.7**	**25**
2020	18.9	**25**

3.3.3. $PM_{2.5}$ Monitoring – DPE

A summary of the available $PM_{2.5}$ monitoring data from 2018 to 2022 for the DPE monitoring stations is presented in **Table 7**. Recorded 24-hour average $PM_{2.5}$ concentrations are presented in **Figure 8.**

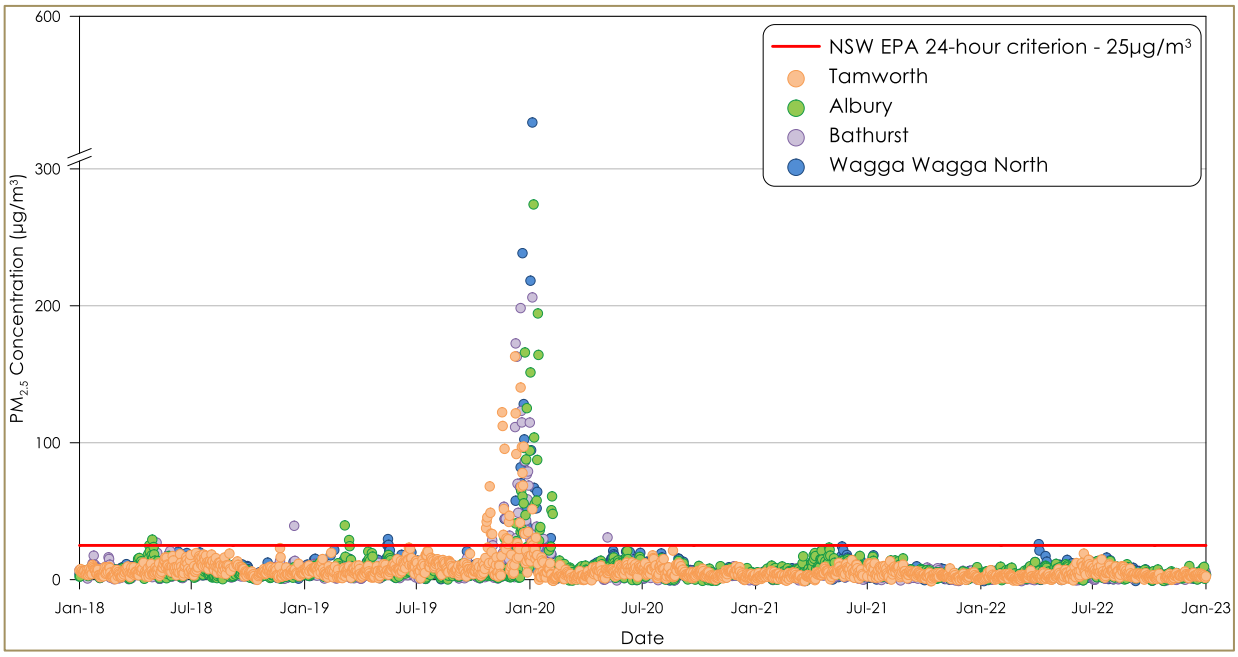
A review of **Table 7** indicates that the annual average $PM_{2.5}$ concentrations were above the relevant criterion of 8µg/m^3 on occasion during the review period. The maximum 24-hour average $PM_{2.5}$ concentrations were found to exceed the relevant criterion of 25µg/m^3 for most of the review period.

Figure 8 shows the monitors following similar trends with regional events recorded at all monitoring stations. Similar to the PM_{10} monitoring data, the mass bushfires affecting NSW in 2019 and 2020 are seen in the $PM_{2.5}$ monitoring data.

Table 7: Summary of $PM_{2.5}$ Levels from DPE Monitoring Stations (µg/m^3)

Year	Tamworth	Albury	Bathurst	Wagga Wagga North	Criterion
		Annual average			
2018	**8.3**	7.3	7.0	**8.4**	**8**
2019	**14.4**	**10.1**	**11.3**	**11.3**	**8**
2020	6.8	**11.1**	7.6	**10.7**	**8**
2021	5.1	7.3	5.1	6.3	**8**
2022	4.7	5.6	4.1	5.3	**8**
Year		Maximum 24-hour average			Criterion
2018	24.2	**30.4**	**40.5**	21.6	**25**
2019	**164.2**	**167.1**	**199.5**	**239.6**	**25**
2020	**52.6**	**275.2**	**207.3**	**559.5**	**25**
2021	15.5	24.6	13.8	**25.4**	**25**
2022	20.2	15.3	11.3	**27.1**	**25**

Figure 8: 24-Hour Average $PM_{2.5}$ Concentrations



3.3.4. TSP Monitoring – HVAS

A summary of the available TSP monitoring data from 2015 to 2020 for the HVAS monitoring station is presented in **Table 8**.

A review of **Table 8** indicates that the annual average TSP concentrations were below the relevant criterion of 90µg/m^3 for all years.

Table 8: Summary of TSP Levels from HVAS Monitoring Stations (µg/m^3)

Year	HVAS Annual average	Criterion
2015	36.5	**90**
2016	28.2	**90**
2017	42.1	**90**
2018	52.4	**90**
2019	74.3	**90**
2020	48.2	**90**

3.3.5. Deposited Dust Monitoring

A summary of the available deposited dust monitoring data from 2015 to 2020 for the deposited dust gauges is presented in **Table 9**.

Table 9 shows the annual average deposited dust levels that were above the relevant criterion of 4 g/m^2/month on occasion during the review period.

Table 9: Summary of Deposited Dust Levels from Monitoring Stations (µg/m^3)

Year	DDG1 Annual average	DDG2 Annual average	Criterion
2015	**4.9**	**4.5**	**4**
2016	2.2	1.3	**4**
2017	1.9	2.1	**4**
2018	**4.1**	3.6	**4**
2019	3.1	**4.2**	**4**
2020	2.5	3.5	**4**

4. MANAGEMENT MEASURES

The activities at the Site will generate some amount of dust emissions, therefore it is prudent to take reasonable and practicable measures to prevent and minimise excessive generation of dust emissions which may affect the surrounding environment.

Condition B24 of the consent identifies that this AQGHGMP is required to describe the air quality mitigation measures that will be implemented to ensure compliance with Conditions B22 (**Table 2**). This section has been prepared to satisfy the requirements and describes the existing air quality environment and mitigation measures to minimise the off-site odour, blast fume and dust emissions generated by Site-related activities.

4.1. Odour Mitigation Management Measures

As the Site would not result in the production of offensive odour, no odour mitigation and management measures have been included in this AQGHGMP.

4.2. Existing Greenhouse Gas Mitigation Management Measures

The legislative framework for the National Greenhouse and Energy Reporting Scheme (NGERS) requires mandatory reporting for facilities or corporations who trigger relevant GHG or energy consumption thresholds.

The facility threshold is 25kt of CO2-e or 100TJ of energy consumed, and the corporate threshold for 2010-11 onwards is 50kt of CO2-e or 200 TJ of energy consumed. Emissions are reported annually in accordance with the NGERS.

Additionally, the development consent requires that the Site implement best practice air quality management. As a result, the company implements the GHG management measures identified in **Table 10**.

Table 10: Greenhouse Gas Management Measures

Management Measure	Implementation Date	Person Responsible
Progressively optimise the underground mine design to minimise travel distances for mining equipment and re-handling of waste and ore material. Use mining equipment which is regularly maintained and serviced to maximise efficiency. Adopt the use of energy efficient lighting technologies and hot water and air conditioning systems wherever practical.	Ongoing	General Manager
Maintain equipment as per the manufacturer's specification.	Ongoing	All Personnel
Maximise the recovery of recyclable materials where practicable, including: • Waste hydrocarbons; • Polyethylene; and, • Scrap metals.	Ongoing	Environment Team
Minimise waste sent to landfill through the development of appropriate purchasing and waste management plans. Progressively review and implement energy efficiency measures throughout the life of the Site. Emissions and abatement strategies will be reported annually.	Annual	General Manager

The Site acknowledges it obligations under the Commonwealth Clean Energy Act 2011 which came into force on 2 April 2012. The Site will maintain a GHG reporting system to track energy consumption and GHG emissions, establish targets for reduction and facilitate assessment and reporting against targets for reduction. The results from the GHG reporting

system will be regularly reviewed to ensure the data being collected is meaningful. Operating/management measures will be modified on the basis of the results, where appropriate.

4.3. Gold Smelting Impacts

The Site includes a processing facility. Activities associated with that facility will include the use of a small furnace/kiln. The furnace would be used to process the gravity concentrate to produce gold doré, or unrefined gold bars. In summary, pyrite would breakdown under heating to produce sulfur dioxide (SO_2). Oxides of nitrogen would also be produced from the combustion of gas to fire the furnace. No other significant pollutants would be expected to be produced.

Hera Resources will ensure through installation of an appropriate scrubber that the processing facility is designed to comply with the relevant emission criteria identified in the *Protection of the Environment Operations (Clean Air) Regulation* (2022) (Schedule 3 – Non-ferrous metals) which are presented in **Table 11**.

Table 11: POEO Act in-Stack Concentration Criteria

Air Impurity	Standard of Concentration (Group 6)
Non-ferrous metals (excluding aluminium): primary production (smelting)	
Solid particles (Total)	50mg/m^3
Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent	350mg/m^3
Volatile organic compounds (VOCs), as n-propane equivalent	40mg/m^3 VOCs or 125mg/m^3 CO
Type 1 substances (in aggregate)	-
Type 1 substances and Type 2 substances (in aggregate)	1mg/m^3
Cadmium (Cd) or mercury (Hg) individually	0.2mg/m^3
Dioxins or furans	0.1 ng/m^3
Smoke	Ringelmann 1 or 20% opacity
General Standards of Concentration	
Sulfuric acid mist (H2SO4) or sulphur trioxide (SO3) or both, as SO3 equivalent	100 mg/m3

4.4. Air Quality Management Measures

The Site currently employs several air quality mitigation and management measures to reduce dust emissions as far as practical.

A summary of air quality management measures existing at the Site which are to be continued are outlined in **Table 12.**

Table 12: Existing Air Quality Management Measures

Source	Control Procedure	Person Responsible
Wind Blown Dust		
Areas disturbed by mining	• Minimise the dust generating impacts during adverse meteorological conditions and extraordinary events. • Limit disturbance to the minimum area necessary for mining and associated activities. • Stabilise disturbance areas as soon as practicable after they are no longer required for mining-related purposes to minimise dust generation. • Contour the final landform shape to avoid strong wind flows and smooth gradients to reduce turbulence at surface. • Apply vegetative cover to non-operational exposed surfaces, e.g. Sediment Basin edges, water diversion drains (where necessary).	Environment Team
Ore Handling Areas/Stockpiles	• Maintain ore handling areas/stockpiles in a moist condition by using water carts to water down areas affected by wind-blown and traffic-generated dust.	Mining Manager
Topsoil Stockpiling	• Establish vegetative cover over all long-term topsoil stockpiles not regularly used, within three months of stockpiling. • Profile all surfaces to reduce velocity of overland winds.	Environment Team
Site Design and Construction		
Transport of ore	• Use conveyors within the processing plant to transport crushed ore material.	Processing Manager
Processing Plant	• Install suitable dust control measures such as water sprays to ensure that the required level of dust suppression is achieved. • Minimise drop-heights from the ROM bin to the primary crusher.	Processing Manager
Roads	• Ensure vehicles only drive on designated roads.	General Manager
Site Operations		
Processing	• Maintain and inspect the crusher, dry screen and all other dust control technologies, in accordance with supplier recommendations. • All dust control equipment must be operable at all times with the exception of shutdowns required for maintenance.	Processing Manager
Tailings Storage Deposition	• Maintain approximately 75% of the TSF area as wet, with emissions restricted to 25% of the surface area of the TSF. • Cap the TSF during rehabilitation activities following completion of mining operations.	Processing Manager Environment Team
Roads	• Spray unsealed access roads and other trafficked areas with water carts at a rate of 2L/m^2/hour, as required, when visible dust is generated. • Restrict speed limit to 40 km/hr on all internal access roads to minimise dust generation. • Obsolete roads to be ripped and re-vegetated. • Ensure that all concentrate vehicles leaving the Site are covered to prevent concentrate material blowing from the truck, except during loading and unloading.	Environment Team / Processing Manager
Blasting Operations	• Ensure that all surface blasts are appropriately designed to minimise emission of particulate matter.	Mining Manager

The Environment Team will ensure site personnel understand the fundamentals of dust emissions and have been trained to timely report any visible emissions. This will allow prompt and appropriate action to be undertaken for the management of the identified emissions.

5. AIR QUALITY MONITORING PROGRAM

Air quality monitoring will be undertaken to determine compliance with the SSD 23419456 and EPL 20179 criteria. The monitoring will be done by an independent, suitably qualified and experienced expert.

Air quality monitoring will continue at the Site measuring concentration reported annually and will include the following:

- High Volume Air Sampler (HVAS) to monitor TSP and/or PM_{10} concentrations.

The development consent states that the AQGHGMP must include a meteorological monitor, as well as air quality monitors to evaluate air quality performance. As a result, air quality monitoring will be conducted to satisfy the above requirements, and the results used for:

- Evaluating and reporting compliance;
- Assessing and reporting performance; and,
- Active site management, including incident and complaint management and investigation.

This will require air quality and meteorological monitoring equipment to be operated during the life of the Site. Additionally, the development consent requires that the operation use best practice air quality management on site. As a result, the Site will implement the following air quality monitoring management measures:

- Prepare an Air Quality Monitoring Program (this report) in consultation with the EPA and surrounding community;
- Install an automated real-time meteorological monitoring program in accordance with the recommendations of the *Approved Methods for the Sampling and Analysis of Air Pollutant in NSW* (**EPA, 2022**).

5.1. Impact Assessment Criteria

Table 13 and **Table 14** presents the impact assessment criteria that are consistent with B22 of the development consent for the Site. The Site must be operated in accordance with the development conditions and meet the requirements of the *Protection of the Environment Operations (Clean Air) Regulation* (2022) and associated air quality limits or guideline criteria.

Air emissions from the Site must not cause actual or potential harm to human health and safety or interfere with the amenity of surrounding land uses.

Table 13: Impact Assessment Criteria – Federation Mine

Pollutant	Averaging period	Criterion
Particulate matter <10µm (PM_{10})	Annual	[a, c] 25µg/m³
	24 hour	[b] 50µg/m³
Particulate matter <2.5µm ($PM_{2.5}$)	Annual	[a, c] 8µg/m³
	24 hour	[b] 25µg/m³
Total suspended particulate (TSP) matter	Annual	[a, c] 90µg/m³

Notes:

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

[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).

[c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

Table 14: Impact Assessment Criteria – Hera Mine

Pollutant	Averaging period	Criterion
Particulate matter <10µm (PM_{10})	Annual	[a, d] 25µg/m^3
	24 hour	[a] 50µg/m^3
Total suspended particulate (TSP) matter	Annual	[a, d] 90µg/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 increase in deposited dust level)

Notes:

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

[b] Incremental impact (i.e. incremental increase in concentrations due to the development 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, fire incidents or any other activity agreed by the Planning Secretary.

The air quality criteria in **Table 13** and **Table 14** do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

5.2. Monitoring Locations

Table 15 and **Figure 9** presents the air quality monitoring locations.

Table 15: Air Quality Monitoring Locations

Identifier	Type	Purpose
BAM Trailer	E-Bam monitor	Real time PM_{10}
Dust Sentry 1	Paired with DDG5	Real time PM_{10}
Dust Sentry 2	Paired with DDG6	Real time PM_{10}
HVAS	High Volume Air Sampler	Monitor PM_{10} and TSP adjacent to the Site Camp.
Weather Station	Automatic Weather Station	Monitor meteorological conditions within the Site.
S1	Stack monitoring location	Monitor gas emissions from the gold room furnace stack (EPL Point 24).
S2	Stack monitoring location	Monitor gas emissions from the new gold room furnace stack (EPL Point 39).

Note: S1 and S2 are not displayed on **Figure 9**.

The location of the monitors were selected in accordance with AS/NZS 3580.1.1:2016 *Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment*, and to be representative of the closest receptors. In determining the location presented in **Figure 9**, the three main considerations were:

- The prevailing wind conditions as presented in **Figure 6**;
- Location of sensitive receptors; and,

The results of the predictive dispersion modelling conducted for the Project (**ERM, 2021**). Based on the modelling results, no additional monitoring locations are required.

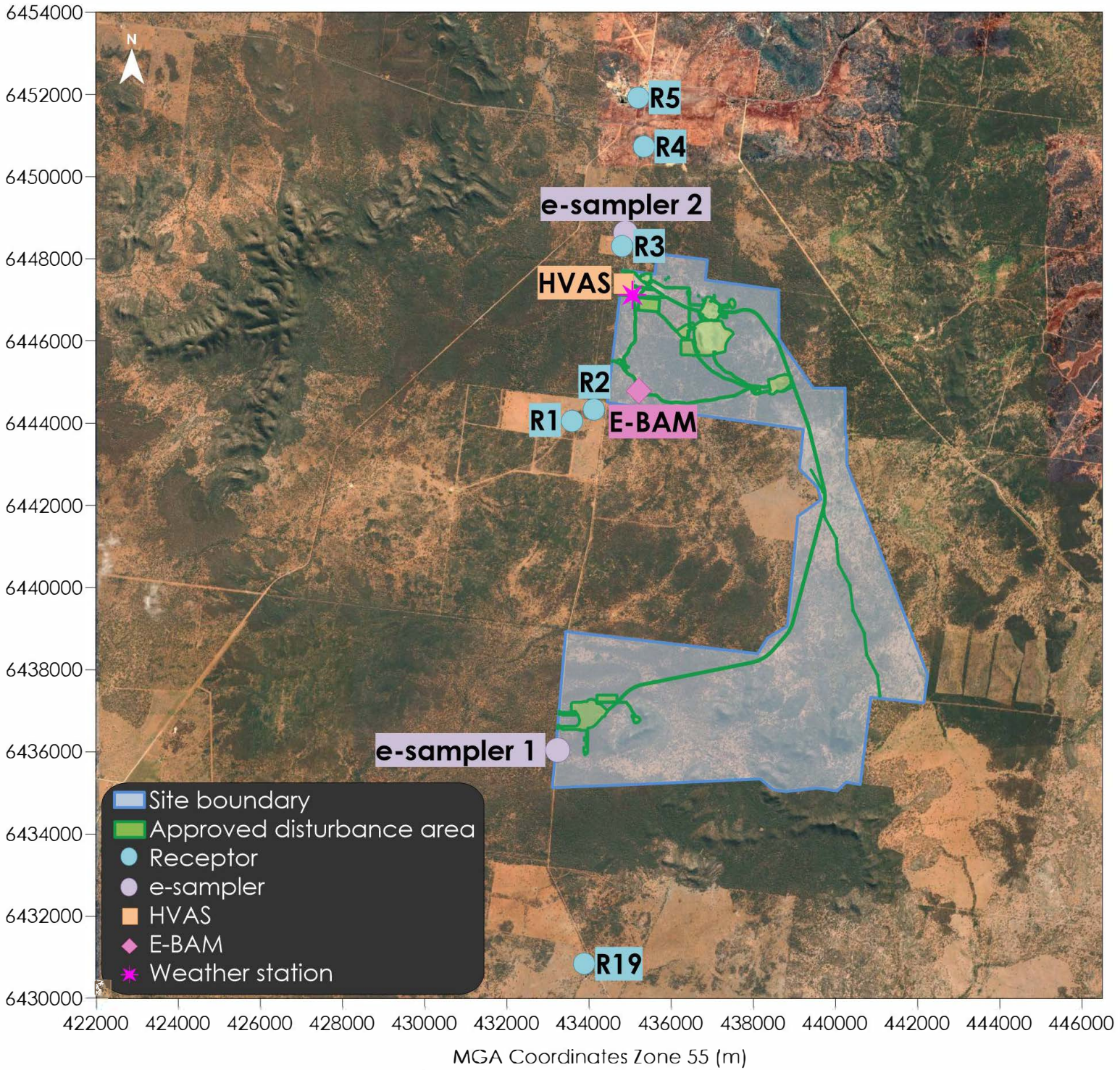


Figure 9: Air Quality Monitoring Network

5.3. Monitoring Procedures

5.3.1. Meteorological Monitoring

Hera Resources is required to operate a meteorological station in accordance with Condition B29, which states:

B29. Prior to the commencement of construction and for the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that:

(a) complies with the requirements in the Approved Methods for Sampling and Analysis of Air Pollutants in NSW (EPA, 2022) and Ambient Air Monitoring Guidance Note (EPA, 2022); and

(b) is capable of measuring meteorological conditions in accordance with the NSW Noise Policy for Industry (EPA, 2017),

unless a suitable alternative is approved by the Planning Secretary following consultation with the EPA.

The Site operates a meteorological station capable of continuous monitoring. The meteorological station is operated in accordance with the following guidelines:

- Approved methods for the Sampling and Analysis of Air Pollutants in NSW (**EPA, 2022**);
- AS/NZS 3580.1.1:2016 Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment, specifically methods AM-2 and AM-4;
- AS 3580.14-2011 Methods for sampling and analysis of ambient air - Part 14: Meteorological monitoring for ambient air quality monitoring applications Contingency Plan; and,
- USEPA (2000) EPA 454/R-99-005 Meteorological Monitoring Guidance for Regulatory Modelling Applications.

The parameters in **Table 16** are to be monitored by the meteorological station.

Table 16: Weather Station Requirements

Parameter	Unit of measure	Frequency	Averaging period	Sampling method
Rainfall	Mm	Continuous	1 hour	AM-4
Wind speed @10 meters	m/s	Continuous	15 minute	AM-2 & AM-4
Wind direction @10 meters	^{o}	Continuous	15 minute	AM-2 & AM-4
Temperature @2 meters	^{o}C	Continuous	15 minute	AM-4
Temperature @10 meters	^{o}C	Continuous	15 minute	AM-4
Sigma theta @10 meters	^{o}	Continuous	15 minute	AM-2 & AM-4
Solar radiation	W/m^2	Continuous	15 minute	AM-4
Relative humidity	%	Continuous	1 hour	AM-4

5.3.2. Real-Time Monitoring

An E-BAM with the capability to provide real-time measurements of PM_{10} and $PM_{2.5}$ simultaneously will be installed and operated.

5.3.3. High Volume Air Sampler Monitoring

The High Volume Air Sampler (HVAS) unit will be operated in accordance with the following:

- AS/NZS 3580.1.1:2016 Methods for sampling and analysis of ambient air - Part 1.1: Guide to Siting Air Monitoring Equipment
- Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC, 2007), and

- AS/NZS 3580.9.6:2015 Methods for Sampling and Analysis of Ambient Air Part 9.6: Determination of Suspended Particulate Matter - PM_{10} High Volume Sampler with Size-Selective Inlet - Gravimetric Method.

HVAS units operate over a 24 hour period every sixth day, drawing a known volume of air through a filter to determine the average PM_{10} and TSP concentration over that 24 hour period. The pre-weighed filters collected every 6 days from the HVAS units will be sent to a NATA accredited laboratory for analysis, generally in monthly batches.

5.3.4. Gold Room Stack Monitoring

Hera Resources will undertake monitoring of exhaust gasses from the gold room furnace stacks (for gaseous emissions). Emissions will be monitored annually for nitric oxide concentrations (mg/m^3) at the following locations:

- Stack 1 (EPL Point 24) - Monitor gas emissions from the gold room furnace stack, and
- Stack 2 (EPL Point 39) - Monitor gas emissions from the new gold room stack.

Monitoring for nitric oxide will be undertaken using method TM-11 as outlined in *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (**EPA, 2022**).

6. CONTINGENCY PLAN

Unpredicted air quality impacts may include:

- Bushfires, hazard reduction burns, and dust storm events;
- Abrupt changes in weather conditions that result in the possibility for high dust impact events; and,
- Nearby operations that may increase dust impacts in the surrounding area.

Where unpredicted impacts are identified, mitigation measures would be implemented including:

- Management measures to mitigate any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible:
    - Minimise dust generating activities or cease/pause dust generating activities during adverse meteorological conditions and extraordinary events;
    - Maintain ore handling areas/stockpiles in a moist condition by using water carts to water down areas affected by wind-blown and traffic generated dust; and,
    - Spray unsealed access roads and other trafficked areas with water carts.

Further detail regarding the corrective actions to be undertaken at the Site in the event of unpredicted air quality related impacts are described in **Section 6.1.**

6.1. Trigger Action Response Plans

The trigger action response plan (TARP) defines the minimum set of corrective actions that Federation must implement in response to unpredicted impacts or abnormal conditions (triggers). The trigger levels are determined based on regulatory requirements, previous monitoring and best practice management. The TARP is displayed in **Table 17.**

Table 17: Trigger Action Response Plan

Key Element	Trigger/Response	Condition Green	Condition Orange	Condition Red
PM_{10}	Trigger	Monitoring results within criteria. PM_{10} trigger level not exceeded.	Real time monitoring indicates PM_{10} level exceeds trigger level of 50 µg/m³ over a 1 hour period. (note once tripped, alarms will not reset until back under trigger level)	Real Time monitoring indicates an exceedance of the PM_{10} 24-hour air quality criteria of 50 µg/m³.
	Response	No response required. Continue monitoring program.	Review operations to reduce dust emissions. Implement any additional mitigation measures as required. Modify operations if applicable.	Complete incident investigation to determine the cause of the exceedance. Review effectiveness of mitigation measures. Modify operations if applicable. Notify relevant government agencies and impacted landowners in accordance with the procedure in the Management Plan. Consider review of Management Plan if required.
Visual Dust	Trigger	Wind Speeds below 15kph. OR No visible dust leaving the Site.	Wind Speeds between 15 and 30kph. OR Visible dust plume observed with potential to cross the Site boundary.	Wind Speeds > 30kph OR Visible dust plume observed crossing the Site boundary.
	Response	Continue AQMP implementation.	Mine Manager reviews effectiveness of control measures. Implement additional remedial measures, such as the deployment of additional water cart/water sprays, relocation or modification of dust-generating sources and temporary halting of dust generating activities.	Inspection of site by Mine Manager to determine if there is a need to halt dust generating activities. Halted activities do not recommence until remedial measures or additional remedial measures are in place or wind speeds drop to acceptable levels record as a non - compliance in the incident report.

7. INCIDENT AND COMPLAINT MANAGEMENT

7.1. Incident and Non-compliance Protocol

Hera Resources will manage any air quality incident or non-compliance at the Site in accordance with the incident and non-compliance protocols found in the Environmental Management Strategy (EMS). In summary Hera Resources will, at the earliest opportunity:

- Take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur
- Consider all reasonable and feasible options for remediation (where relevant) and submit a report to the DPE describing those options and any preferred remediation measures or other course of action
- Implement remediation measures as directed by the Secretary, to the satisfaction of the Secretary, and
- Submit an incident report within seven days of the original notification.

7.2. Complaints Management

The EMS includes a detailed complaints management procedure. This sub-section records the procedures that would be implemented following the receipt of an air quality-related complaint.

Complaints can be directed to the Company via phone or email. These details are presented in **Table 18.**

Table 18: Contact Details for Complaints

Communication Method	Details
Email	complaints@aureliametals.com.au
Telephone	1300 016 240

Following receipt of any air-quality related complaint, the Site's personnel would implement the following procedure:

1. The complaint will be reviewed to determine the nature, date and time of the complaint source.
2. Relevant monitoring data for the period will be examined. The complainant will be contacted to discuss and attempt to resolve the complaint.
3. In the event that the complaint is resolved via Step 2, no further action would be taken. If not resolved, then supplementary monitoring may be undertaken within one month of the conclusion of Step 2 in accordance with the procedures identified in **Section** Error! Reference source not found..
4. Should the review of the monitoring data indicate that no non-compliance of the relevant criteria was identified, this may be communicated to the complainant.
5. Should the review of monitoring data indicate that a non-compliance of the relevant criteria, Hera Resources will notify the relevant government agencies. In addition, the complainant may be notified if required.

If multiple complaints are received from the same individual(s) and Hera Resources can demonstrate compliance to the relevant criteria and previous efforts have been made to resolve their issues, then Hera Resources may limit their response to Step 1 and 2.

8. REPORTING

8.1. Annual Reporting

Hera Resources is required to prepare an Annual Review each year in accordance with Condition C10, which states:

By the end of September each year after the date of physical commencement of development under this consent, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must:

(a) describe the development (including any rehabilitation) that was carried out in the previous financial year, and the development that is proposed to be carried out over the current financial year;

(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, including a comparison of these results against the:

(i) *relevant statutory requirements, limits or performance measures/criteria;*

(ii) *requirements of any plan or program required under this consent;*

(iii) *monitoring results of previous years; and*

(iv) *relevant predictions in the document/s listed in condition A2(c);*

(c) identify any non-compliance or incident which occurred in the previous financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;

(d) evaluate and report on compliance with the performance measures, criteria and operating conditions of this consent;

(e) identify any trends in the monitoring data over the life of the development;

(f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and

(g) describe what measures will be implemented over the next financial year to improve the environmental performance of the development.

Hera Resources must also submit and Annual Return in accordance with Condition R1.1 of EPL 20179 which states:

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. *a Statement of Compliance,*
2. *a Monitoring and Complaints Summary,*
3. *a Statement of Compliance – Licence Conditions,*
4. *a Statement of Compliance -Load based Fee,*
5. *a Statement of Compliance -Requirement to Prepare Pollution Incident Response Management Plan,*
6. *a Statement of Compliance – Requirements to Publish Pollution Monitoring Data; and*
7. *a Statement of Compliance – Environmental Management Systems and Practices.*

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

8.2. Greenhouse Gas Reporting

Hera Resources will report annually to the NGERS and (as required) Energy Efficiency Opportunities (EEO) programs, and reports will be made public under these schemes. The reports will contain the following:

- Energy usage
- GHG emissions
- GHG reduction measures
- Review of previous energy/GHG reduction measures, and
- Any other information relevant to NGERS reporting.

All GHG data will be maintained for a minimum of seven years in accordance with the *National Greenhouse and Energy Reporting Act* 2007.

8.3. Incident Reporting

An incident is defined in the consent as:

An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance.

Hera Resources will report any incidents in accordance with the protocol described in the EMS and Condition C8 and Appendix 6 of SSD 24319456. Condition C8 states:

The Planning Secretary must be notified in writing via the Major Projects website immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one) and set out the location and nature of the incident. Subsequent notification requirements must be given, and reports submitted in accordance with the requirements set out in Appendix 6.

8.4. Non – Compliance Reporting

A non-compliance is defined in the consent as:

An occurrence, set of circumstances or development that is a breach of this consent.

Hera Resources will report any incidents in accordance with the protocol described in the EMS and Condition C9 of SSD 23419456. Condition C9 states:

The Planning Secretary must be notified in writing via the Major Projects website within seven days after the Applicant becomes aware of any non-compliance. A non-compliance notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

***Note**: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.*

In summary, a written report will be provided within seven days which will include the following:

- Describes the date, time, and nature of the exceedance;
- Identifies the case (or likely cause) of the exceedance;
- Describes the action to date; and
- Describes the proposed measures to address the exceedance.

8.5. Independent Environmental Audit

Hera Resources will commission and provision for an Independent Environmental Audit in accordance with Conditions C12 and C13 which state:

C12 Within one year of the date of physical commencement of development under this consent, and every three years after, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. The audit must:

(a) be prepared in accordance with the *Independent Audit Post Approval Requirements* (**NSW Government, 2020**)*; and*

(b) be submitted, to the satisfaction of the Planning Secretary, within two months of undertaking the independent audit site inspection, unless otherwise agreed by the Planning Secretary.

And;

C13 In accordance with the specific requirements of the Independent Audit Post Approval Requirements (NSW Government 2020), *the Applicant must:*

(a) review and respond to each Independent Audit Report prepared under Condition C12 of this consent;

(b) submit a response to the Planning Secretary and any other NSW agency that requests it, together with a timetable for the implementation of the recommendations of the Independent Audit Report;

(c) implement the recommendations to the satisfaction of the Planning Secretary; and

(d) make each Independent Audit Report and response to it publicly available no later than 60 days after submission to the Planning Secretary.

8.6. Access to Information

Hera Resources will commission and provision for monitoring and environmental audits in accordance with Condition C15 which states:

C15. Within three months of the date of physical commencement of development under this consent, until the completion of all rehabilitation required under this consent, the Applicant must:

(a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website:

(i) *the document/s listed in condition A2(c);*

(ii) *all current statutory approvals for the development;*

(iii) *all approved strategies, plans and programs required under the conditions of this consent;*

(iv) *minutes of CCC meetings;*

(v) *regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent;*

(vi) *a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;*

(vii) *a summary of the current phase and progress of the development;*

(viii) *contact details to enquire about the development or to make a complaint;*

(ix) *a complaints register, updated monthly;*

(x) *the Annual Reviews of the development;*

(xi) *audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant's response to the recommendations in any audit report; and*

(xii) *any other matter required by the Planning Secretary; and*

keep such information up to date, to the satisfaction of the Planning Secretary.

9. ROLES AND RESPONSIBILITIES

The roles and responsibilities for Hera Resources personnel in relation to this AQGHGMP are listed in **Table 19.**

Table 19: Roles and Responsibilities

Position	Accountable Task
General Manager	• Ensure the resources are available for the implementation of this AQGHGMP. • Be accountable for the overall environmental performance of the Site, including the outcomes of this AQGHGMP. • Ensure operational hours are adhered to. • Ensure appropriate dust suppression controls are installed.
Environment Team	• Ensure that the requirements of this AQGHGMP are effectively implemented. • Ensure the results of all monitoring are recorded. • Ensure all internal and external reporting requirements are met. • Ensure all personnel undertaking works in relation to this management plan are trained and competent. • Update the Management Plan as required. • Undertake/organise, review and analyse all monitoring data.
Production Manager	• Ensure that all equipment and processing plants are optimally operating with regular maintenance and inspection intervals.
All Personnel	• All personnel shall undergo air quality and greenhouse gas management awareness training through the induction and re-induction process.

10. TRAINING AND AWARENESS

All personnel shall undergo air quality and greenhouse gas management awareness training through the induction and re-induction process. Air quality management shall be a component of the competency-based site induction program. The following areas shall be covered in the induction.

- Awareness of prevailing wind directions and their potential to increase air emissions downwind.
- Awareness of the potential to create dust or air emissions and the necessary controls to mitigate.
- Awareness of monitoring of air quality at sensitive residential receiver.
- Awareness of making timely reporting of any visible emissions to allow for prompt and appropriate action to be undertaken for the management of the identified emissions.

The Environment Team shall be responsible for ensuring the appropriate air quality management training is included in the induction.

11. REVIEW AND IMPROVEMENT

This AQGHGMP will be reviewed and revised as necessary in accordance with the requirements of Condition C6 of SSD 23419456 which states that reviews must be conducted:

Within three months of:

(a) the submission of an incident report under condition C8;

(b) the submission of an Annual Review under condition C10;

(c) the submission of an Independent Environmental Audit under condition C12; or

(d) the approval of any modification of the conditions of this consent (unless the conditions require otherwise);

(e) notification of a change in development phase under condition A5; or

(f) a direction of the Secretary under condition A3 of Schedule 2

The suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.

As part of the review process, the Site will assess the adequacy of the plan to meet the requirements contained in the relevant statutory approvals and any opportunities for improvement. The assessment will include a review of data and related trends identified in the Annual Review, a consideration of recommendations from an Independent Environmental Audit and findings arising from any incident report. If required, the plan will be updated in consultation with DPE and other relevant agencies.

11.1. Greenhouse Gas Abatement Review

To satisfy Condition B26 of the consent, Site will conduct a review of this AQGHGMP every 3 years to consider the following information in relation to Scope 1 and Scope 2 emissions:

- A review of abatement technologies relevant to the Sites GHG emissions.
- A detailed review of the feasibility of implementing various GHG abatement options, and economic considerations for the Site.
- A 3-year action plan to investigate and implement reasonable and feasible measure to minimise greenhouse gas emissions.

12. REFERENCES

- ERM Australia Pacific Pty Ltd (ERM) (2021) *Air Quality and Greenhouse Gas Assessment*
- Bureau of Meteorology (2023) Climate statistics for Australian locations, Bureau of Meteorology website, accessed January 2023. http://www.bom.gov.au/climate/averages
- Standards Australia (2011) AS 3580.14-2011 Methods for sampling and analysis of ambient air - Part 14: Meteorological monitoring for ambient air quality monitoring applications
- Standards Australia (2015) AS/NZS 3580.9.6:2015 Methods for Sampling and Analysis of Ambient Air Part 9.6: Determination of Suspended Particulate Matter - PM10 High Volume Sampler with Size-Selective Inlet - Gravimetric Method
- Standards Australia (2016) AS/NZS 3580.1.1:2016 Methods for sampling and analysis of ambient air - Part 1.1: Guide to Siting Air Monitoring Equipment
- Standards Australia (2016) AS/NZS 3580.10.1:2016 Methods for Sampling and Analysis of Ambient Air - Method 10.1: Determination of Particulate Matter - Deposited Matter - Gravimetric Method
- USEPA (2000) EPA 454/R-99-005 Meteorological monitoring guidance for regulatory modelling applications
- NSW EPA (2022) “Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales”, NSW Environment Protection Authority, August 2022.
- NSW EPA (2022) “Approved Methods for the Sampling and Analysis of Air Pollutants in NSW”, NSW Environment Protection Authority, January 2022.
- NSW DPIE (2019) “Dustwatch Report November 2019”, prepared by NSW Department of Planning, Industry and Environment, November 2019.
- NSW DPIE (2020a) “New South Wales Annual Compliance Report 2018”, prepared by Department of Planning, Industry and Environment, July 2020.
- NSW DPIE (2020b) “Dustwatch Report January 2020”, prepared by NSW Department of Planning, Industry and Environment, February 2020.