Government of Western Australia
Department of Environment Regulation

Licence

Environmental Protection Act 1986, Part V

Licensee: Rosslyn Hill Mining Pty Ltd

Licence: L8493/2010/2

Registered office: Suite 1D, 21 Teddington Road
BURSWOOD WA 6100

ACN: 075 523 661

Premises address: Paroo Station Mine
Mining leases M53/502, M53/503, M53/504, M53/1002 and miscellaneous leases L53/106, L53/107, L53/108 and L53/149
WILUNA WA 6646
As depicted in schedule 1.

Issue date: Thursday, 28 November 2013

Commencement date: Friday, 29 November 2013

Expiry date: Sunday, 28 November 2021

Prescribed premises category
Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore; premises on which – a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; b) tailings from metallic or non-metallic ore are reprocessed; or tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	50,000 tonnes or more per year	1,700,000 tonnes per annual period
85	Sewage facility: premises: (a) on which sewage is treated (excluding septic tanks); or (b) from which treated sewage is discharged onto land or into waters.	More than 20 but less than 100 m^3 per day	35 m^3 per day
89	Putrescible landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definition 1996" published by the Chief Executive Officer, as amended from time to time) is accepted for burial.	More than 20 but less than 5 000 tonnes per year	250 tonnes per year

Conditions
This Licence is subject to the conditions set out in the attached pages.

Date signed: 14 February 2017
.....
Tim Gentle
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

Introduction

This Introduction is not part of the Licence conditions.

DER's industry licensing role
The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

Licence requirements
This Licence is issued under Part V of the Act. Conditions contained within the Licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:
http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.

- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.

- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.

You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

Licence fees
If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

Ministerial conditions
If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

Premises description and Licence summary
Rosslyn Hill Mining Pty Ltd (Rosslyn Hill) operates Paroo Station Mine (PSM) located 35 km west of Wiluna in Western Australia. Rosslyn Hill was previously known as Magellan Metals Pty Ltd.

PSM is a conventional lead carbonate concentrate processing plant with a capacity to process 1.7 million tonnes per year of lead carbonate ore. The ore is crushed and ground with the resultant slurry passed through a series of agitators and flotation tanks. The resultant concentrate is dried then bagged and packed into locked shipping containers for transport.

Waste in the form of tailings is pumped along a bunded pipeline corridor to a two-celled paddock style tailings storage facility where it is discharged in a manner that maximises solids consolidation and process water return.

Rosslyn Hill is subject to Ministerial conditions through Ministerial Statement 905 (issued 27 July 2012). Directions from Ministerial Statement 905 outline a detailed transport plan from Paroo Station Mine to the Port of Fremantle.

The acute transport plan is necessary to ensure contamination of the environment from lead carbonate is prevented. The activity of transporting lead concentrates to the Port of Fremantle by road and rail for shipping to overseas customers is not a prescribed activity and will not be regulated under this licence or addressed in this report.

Rosslyn Hill held an *Environmental Protection Act 1986* Registration (R1769) for categories (85) sewage facility, (87) fuel burning and (89) putrescible landfill, which was made inactive as of 15 July 2015.

August 2014 Amendment

This licence amendment is the result of an application by Rosslyn Hill to relocate a portion of the tailings pipeline and also increases the frequency of groundwater monitoring in response to an increasing groundwater level trend observed in monitoring data.

February 2017 Amendment

This Licence is the result of an amendment sought by the Licensee to authorise the construction and operation of an Integrated Waste Landform (IWL) which is a combined waste rock and Tailings Storage Facility. Waste rock landforms are utilised to construct the embankments of the IWL, and tailings are deposited within the embankments.

Categories 85 (sewage treatment) and 89 (landfilling of putrescible waste), previously on Registration R1769, have been transferred to the Licence.

The licences and works approvals issued for the Premises since 29 March 2004 are:

Instrument log		
Instrument	**Issued**	**Description**
W3918/2004/1	29/03/2004	Works approval for category 05
L7982/2004/2	07/02/2005	Licence issued
L7982/2004/2	24/06/2005	Licence amendment to increase throughput of category 5 from 1.2 Mtpa to 1.7 Mtpa
L7982/2004/3	07/08/2005	Licence reissue
L7982/2004/4	08/08/2007	Licence reissue
L7982/2004/5	09/10/2008	Licence reissue
L8493/2010/1	29/11/2010	Licence reissue
L8493/2010/1	24/10/2013	Licence amendment, including conversion to REFIRE format, to change the Licensee and premise names and update licence conditions to correct inaccuracies related to monitoring.
L8493/2010/2	28/11/2013	Licence reissue
L8493/2010/2	15/08/2014	Licence amendment to increase frequency of groundwater monitoring and authorise re-routing of a tailings pipeline.
L8493/2010/2	14/02/2017	Licence amendment to authorise construction and operation of the Integrated Waste Landform (IWL). Authorisation to accept product (lead carbonate concentrate) waste in the event of a spill during transport to the port. Addition of categories 85 and 89. Administrative changes made by DER.

Severance
It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

END OF INTRODUCTION

Licence conditions

1 General

1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986;*

'AHD' means the Australian height datum;

'**Anniversary Date'** means 31 December of each year;

'annual period' means the inclusive period from 1 January until 31 December in the same year;

'AS/NZS 3580.10.1:2003' means the Australian Standard AS/NZS 3580.10.1:2003 *Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method*

'AS/NZS 3580.9.3:2003' means the Australian Standard AS/NZS 3580.9.3:2003 *Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particle matter (TSP) – High volume sampler gravimetric method;*

'AS/NZS 5667.1' means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples;*

'AS/NZS 5667.11' means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters;*

'averaging period' means the time over which a limit is measured or a monitoring result is obtained;

'CEMS' means continuous emissions monitoring system;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means;

Chief Executive Officer
Department Div.3 Pt. V EP Act
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au

'controlled waste' has the definition in *Environmental Protection (Controlled Waste) Regulations 2004*;

'environmentally hazardous material' means material (either solid or liquid raw materials, materials in the process of manufacture, manufactured products, products used in the manufacturing process, by-products and waste) which if discharged into the environment from or within the premises may cause pollution or environmental harm;

'freeboard' means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

'fugitive emissions' means all emissions not arising from point sources identified in section 2.2

'IWL' means Integrated Waste Landform;

'Licence' means this Licence numbered L8493/2010/2 and issued under the Act;

'Licensee' means the person or organisation named as Licensee on page 1 of the Licence;

'NATA' means the National Association of Testing Authorities, Australia;

'NATA accredited' means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

'PM' means total particulate matter including both solid fragments of material and miniscule droplets of liquid;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

'quarterly' means the 4 inclusive periods from 1 January to 31 March, 1 April to 30 June, 1 July to 30 September, and 1 October to 31 December in the same year;

'Schedule 1' means Schedule 1 of this Licence unless otherwise stated;

'Schedule 2' means Schedule 2 of this Licence unless otherwise stated;

'spot sample' means a discrete sample representative at the time and place at which the sample is taken; and

'**TSF**' means Tailings Storage Facility.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.2 General conditions

1.2.1 The Licensee shall recover, or remove and dispose of spills of environmentally hazardous materials which occur outside an engineered containment system, when safe and as soon as possible after the event.

1.3 Premises operation

1.3.1 The Licensee shall ensure that all pipelines containing environmentally hazardous materials are either:
(a) equipped with automatic cut-outs in the event of a pipe failure; or
(b) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

1.3.2 The Licensee shall ensure that tailings are only discharged into containment cells with the relevant infrastructure requirements at the locations specified in Table 1.3.1 and identified in Schedule 1.

Table 1.3.1: Containment infrastructure

Containment cell or dam number(s)	Material	Infrastructure requirements
TSF Cell 1 and 2	Tailings	As depicted in Drawing 95-001, in "DE Cooper & Associates Pty Ltd, May 2000. Proposed Tailings Storage and Waste Rock Stockpile. Notice of Intent".
IWL	Tailings & waste rock	Two downstream embankment raises to a total height of RL 555m (27m). Central Decant as shown in Figure 6 of Schedule 1 Seepage Collection Trench located as shown in Figure 5 of Schedule 1
	Lead carbonate concentrate product waste[1]	

Note 1: Refers to waste generated in the event of spills of product during transport from the Premises to the Port of Fremantle

1.3.3 The Licensee shall manage containment cells in Table 1.3.1 such that a minimum top of embankment freeboard of 500mm or a 1 in 100 year/72 hour storm event (whichever is greater) is maintained.

1.3.4 The Licensee shall:
(a) undertake inspections as detailed in Table 1.3.2;

(b) where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and
(c) maintain a written record of all inspections undertaken, with the record of each inspection signed by the responsible inspector.

Table 1.3.2: Inspection of infrastructure		
Scope of inspection	**Type of inspection**	**Frequency of inspection**
Tailings pipelines	Visual integrity	Daily
Return water lines	Visual integrity	Daily
Embankment freeboard	Visual to confirm required freeboard capacity is available	Daily
Wildlife presence on IWL (birds, other fauna)	Visual	Daily

1.3.5 The Licensee is authorised to construct embankment raises and operate the IWL until the end of Raise 1 to the heights as listed in Table 1.3.3 below:

Table 1.3.3: IWL Construction & Operating Heights		
Stages	**Construction Height (m)**	**Operating Height (m)**
Raise 1	RL 545m	RL 543.7 m
Raise 2	RL 555m	Not permitted at this time

1.3.6 The Licensee must not depart from the specifications in Column 1 and 2 for the infrastructure in each row of Table 1.3.4 except:
(a) where such departure is minor in nature and does not materially change or affect the infrastructure; or
(b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment;
and in accordance with all other conditions in this Licence.

Table 1.3.4: Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (Design and Construction)**
IWL embankments	Maximum height RL 555m, located as per Figure 5
IWL tailings delivery and return water drainage system	• Tailings delivery and return pipework located as shown in Figure 5 • Decant tower as per Figure 6 in Schedule 1 • Seepage collection toe drain located as shown in Figure 5 and constructed as per Figure 7 in Schedule 1.

1.3.7 The Licensee shall complete an annual water balance over the IWL facility. The water balance shall record evaporation, rainfall, decant water returned to the Processing Plant, tailings discharged and seepage water recovered to derive an amount of seepage lost to groundwater.

1.3.8 The Licensee is authorised to accept lead carbonate product waste for disposal into the active Tailings Storage Facility (Integrated Waste Landform) in the event of spills of product during transport from the Premises to the Fremantle Port.

1.3.9 The Licensee shall ensure that where wastes produced on the premises are disposed on site they are only subjected to the processes in Table 1.3.5 and in accordance with the process limits in that table.

Table 1.3.5: Management of waste		
Waste type	**Process**	**Requirements**
Clean fill Putrescible waste	Storage, handling and disposal of waste by landfilling	**All waste types** • No more than 250 tonnes per year of all waste types cumulatively shall be disposed of by landfilling; • Waste shall be placed in a defined trench, with the active tipping area restricted to the dimensions of a bellan landfill cage; • Must meet the acceptance criteria for Class II landfills.

1.3.10 The Licensee shall ensure that wind-blown waste is contained within the boundary of the landfill and that wind-blown waste is returned to the tipping area on at least a monthly basis.

2 Emissions

2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of this Licence.

2.2 Fugitive emissions

2.2.1 The Licensee must ensure fugitive emissions are managed in accordance with the parts of the document specified in Table 2.2.1.

Table 2.2.1: Management Plans		
Management Plan Reference	**Parts**	**Date of Document**
Dust Management Plan: Rosslyn Hill Mining	Section 6, Table 3	April 2015

3 Monitoring

3.1 General monitoring

3.1.1 The Licensee shall ensure that:
(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
(b) all groundwater sampling is conducted in accordance with AS/NZS 5667.11; and
(c) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.

3.1.2 The Licensee shall ensure that :
(a) monthly monitoring is undertaken at least 15 days apart;
(b) quarterly monitoring is undertaken at least 45 days apart;
(c) six monthly monitoring is undertaken at least 5 months apart; and
(d) annual monitoring is undertaken at least 9 months apart.

3.1.3 The Licensee shall record production or throughput data and any other process parameters relevant to any monitoring undertaken.

3.1.4 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications and the requirements of the Licence.

3.1.5 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

3.2 Ambient environmental quality monitoring

3.2.1 The Licensee shall undertake the monitoring in Tables 3.2.1 and 3.2.2 according to the specifications in those tables and record and investigate results that do not meet any limit specified.

Table 3.2.1: Monitoring of ambient air quality

Monitoring point reference and location	Parameter	Units	Frequency	Method
High volume dust sampler HVD (as shown in Schedule 1)	Total suspended particulate[1]	µg/m^3	Every sixth day	AS/NZS 3580.9.3:2003 USEPA Compendium Method IO-3.1 and IO-3.4.
	Lead	µg/m^3	Every sixth day	AS/NZS 3580.9.3:2003 USEPA Compendium Method IO-3.1 and IO-3.4.
Static dust deposition gauges- SDM1, SDM2, SDM3, SDM4, SDM5, SDM6, SDM7, SDM8, SDM9, SDM10, SDM11, SDM12, SDM13, SDM14 and SDM15 (as shown in Schedule 1)	Mass deposition rate	mg/m^2/month	Monthly[2]	AS/NZS 3580.10.1:2003

Table 3.2.2: Monitoring of ambient groundwater quality

Monitoring point reference	Parameter	Limit	Units	Averaging period	Frequency
MTM001, MTM002, TDMB001, TDMB002, TDMB003, TDMB005, TDMB006, TDMB007, TDMB008 IWLMB09, IWLMB10 IWLMB11, IWLMB12 IWLMB13 (as depicted in Figure 3 of Schedule 1)	pH[1]	-	pH units	Spot sample	Monthly
	standing water level[2]	1	mbgl		
	total dissolved solids[1]	-	mg/L		Quarterly
	lead	0.1			
	Aluminium, arsenic, cadmium, chromium, copper, iron, magnesium, mercury, nickel, thallium and zinc.	-			
	total dissolved solids[1]	-	mg/L		
	Aluminium, arsenic, cadmium, chromium, copper, iron, magnesium, lead, mercury, nickel, thallium and				

	zinc.				
Willy Well Crow Well Stone Well (as depicted in Figure 4 of Schedule 1)	pH[1]	-	-	Spot sample	Annual
	standing water level[2]	-	mbgl		
	total dissolved solids[1]	-	mg/L		
	Aluminium, arsenic, cadmium, chromium, copper, iron, magnesium, lead, mercury, nickel, thallium and zinc.				

Note 1: Field sample results are to be reported as per condition 4.2.1. An exemption from NATA laboratory analysis is allowed given geographical remoteness of the sample site and the short holding time of the parameter.
Note 2: Standing water level shall be determined prior to collection of water samples.

3.2.2 Within one month of becoming aware of an exceedance of any limit defined in Table 3.2.2 the Licensee shall design a groundwater recovery plan.

The Licensee shall ensure that the groundwater recovery plan includes:

(a) Notification to the CEO in writing of when and in how many bores the limit could not be met and a map indicating any non-compliant bores;
(b) Any significant environmental impacts observed;
(c) Actions to achieve the groundwater level and groundwater quality limit, including predicted increases in groundwater recovery and any additional recovery bores or trenches required;
(d) Predicted timeframe(s) to implement actions; and
(e) Actions to ensure the limit will be met in the future.

The groundwater recovery plan shall be submitted to the CEO. The Licensee shall implement the plan according to the timeframe(s) in the plan.

4 Information

4.1 Records

4.1.1 All information and records required by the Licence shall:
(a) be legible;
(b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
(c) except for records listed in 4.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
(d) for those following records, be retained until the expiry of the Licence and any subsequent licence:
  (i) off-site environmental effects; or
  (ii) matters which affect the condition of the land or waters.

4.1.2 The Licensee must submit to the CEO within 90 days after the Anniversary Date, an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions in this Licence for the annual period.

4.1.3 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental

impact of the activities undertaken at the Premises and any action taken in response to the complaint.

4.2 Reporting

4.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 90 calendar days after the end of the annual period. The report shall contain the information listed in Table 4.2.1 in the format or form specified in that table.

Table 4.2.1: Annual Environmental Report

Condition or table (if relevant)	Parameter	Format or form[1]
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
-	Actual annual throughput in tonnes	None specified
1.3.6	Annual water balance over the IWL	None specified
Table 3.2.1	Total suspended particulate, mass deposition rate and lead.	None specified
Table 3.2.2	pH, standing water level, total dissolved solids, lead, aluminium, arsenic, cadmium, chromium, copper, iron, magnesium, mercury, nickel, thallium and zinc.	None specified
Table 3.2.2	Limit exceedances	None specified
4.1.3	Compliance	Annual Audit Compliance Report (AACR)
4.1.4	Complaints summary	None specified

Note 1: Forms are in Schedule 2

4.2.2 The Licensee shall submit a compliance document to the CEO, following the completion of each stage of the works under condition 1.3.6 and prior to commissioning of the same.

4.2.3 The compliance document shall:
(a) certify that the works were constructed in accordance with the conditions of the licence;
(b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.

4.2.4 The Licensee shall submit the information in Table 4.2.2 to the CEO according to the specifications in that table.

Table 4.2.2: Non-annual reporting requirements

Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form[1]
-	Copies of original monitoring reports submitted to the Licensee by third parties, as requested by the CEO	Not Applicable	Within 14 days of the CEOs request	As received by the Licensee from third parties

Note 1: Forms are in Schedule 2

4.3 Notifications

4.3.1 The Licensee shall ensure that the parameters listed in Table 4.3.1 are notified to the CEO in accordance with the notification requirements of the table.

Table 4.3.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
3.1.5	Calibration report	As soon as practicable	None specified
-	Production ceasing for an unspecified period of time	As soon as practicable after the decision has been made	None Specified
-	Production recommencing	At least 28 days prior to production recommencing	None specified

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the Act
Note 2: Forms are in Schedule 2

Schedule 1: Maps

Premises map

The Premises is shown in the map below. The red and white dashed line depicts the Premises boundary.

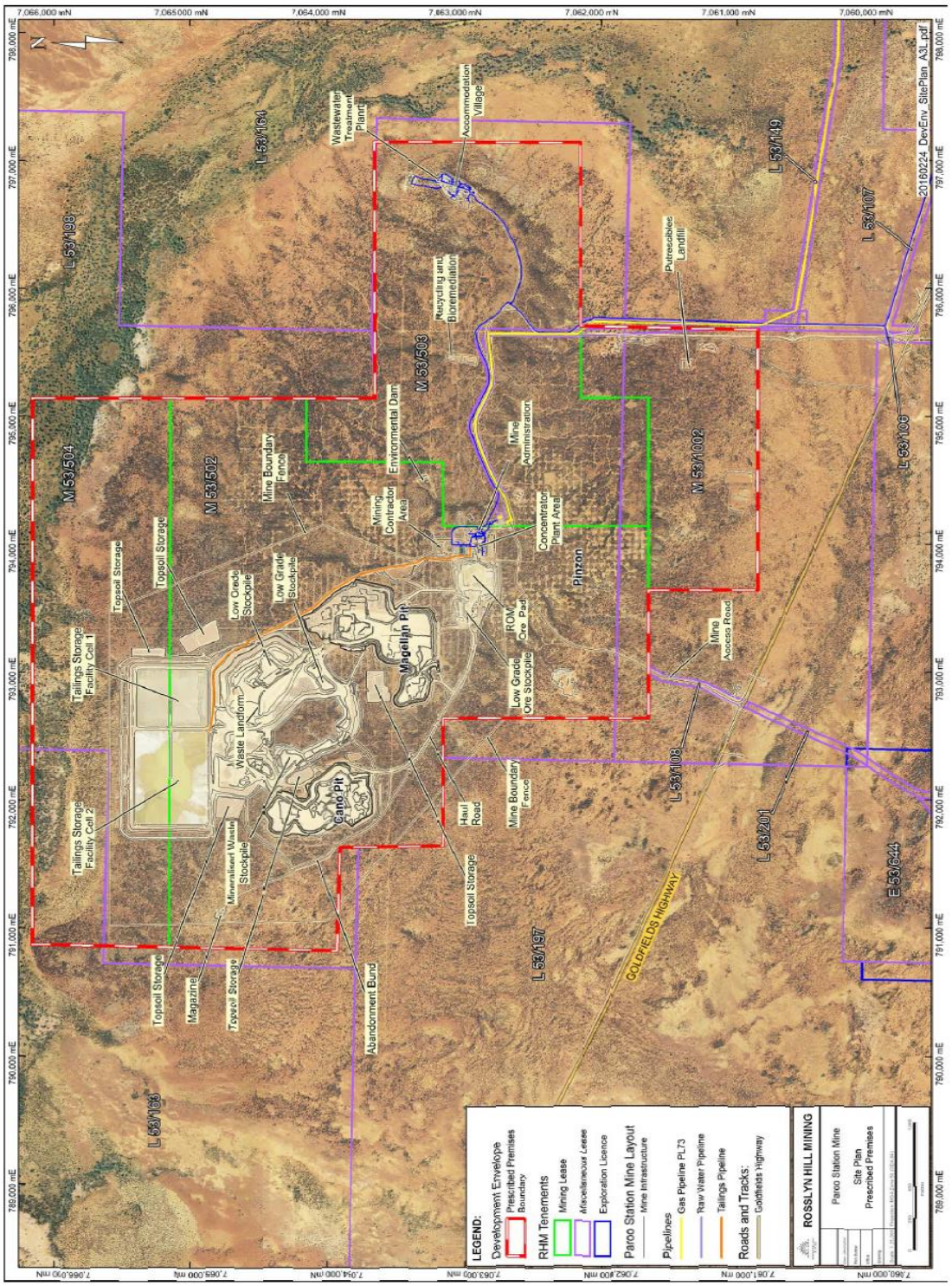

Figure 1: Premises boundary

Map of monitoring locations

The locations of the monitoring points defined in Table 3.2.1 are shown below.

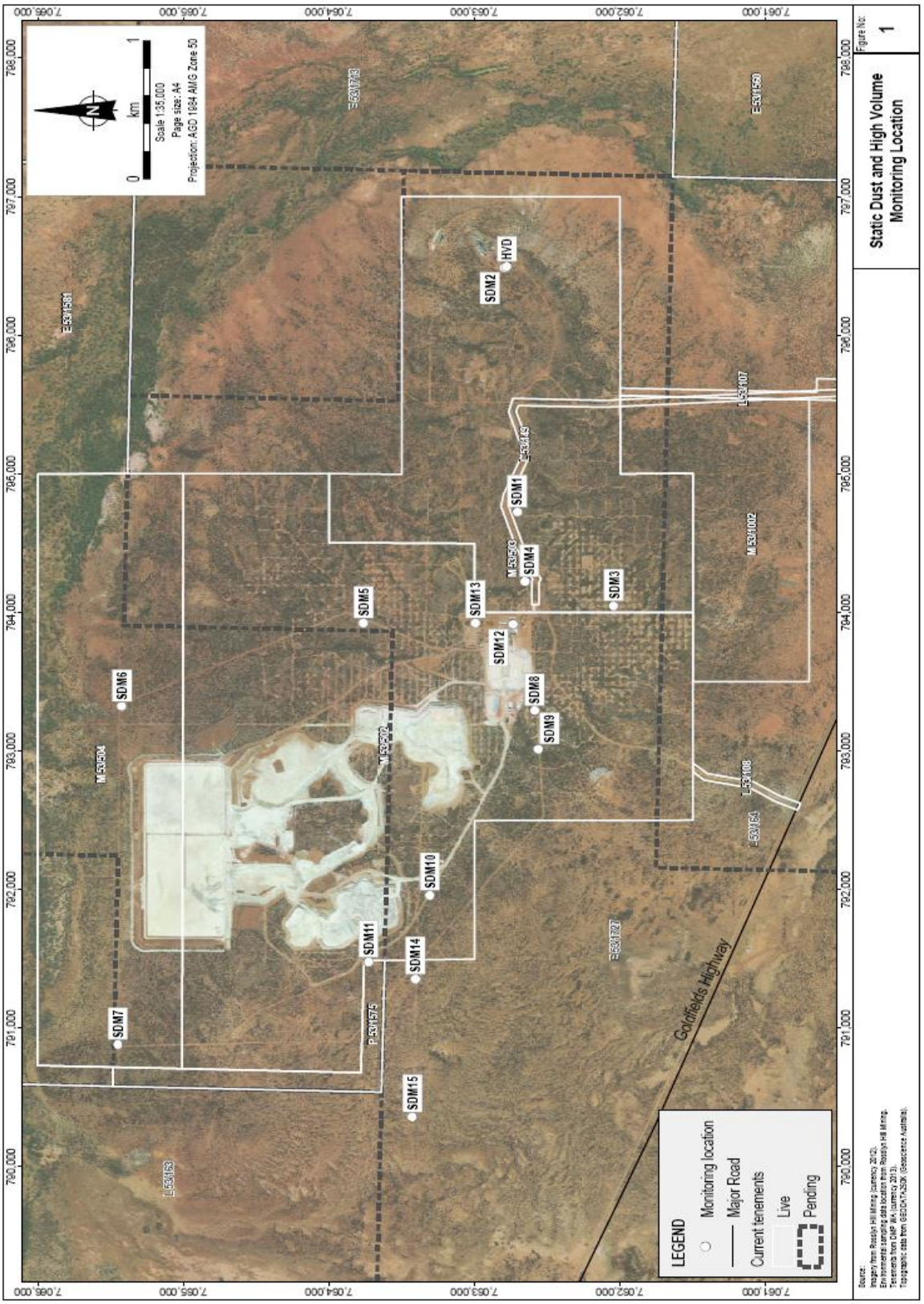

Figure 2: Dust monitoring sites

Map of monitoring and storage locations

The locations of the monitoring points defined in Table 3.2.2 are shown in the Figures following. The location of the storage area defined in Table 1.3.1 is shown below.

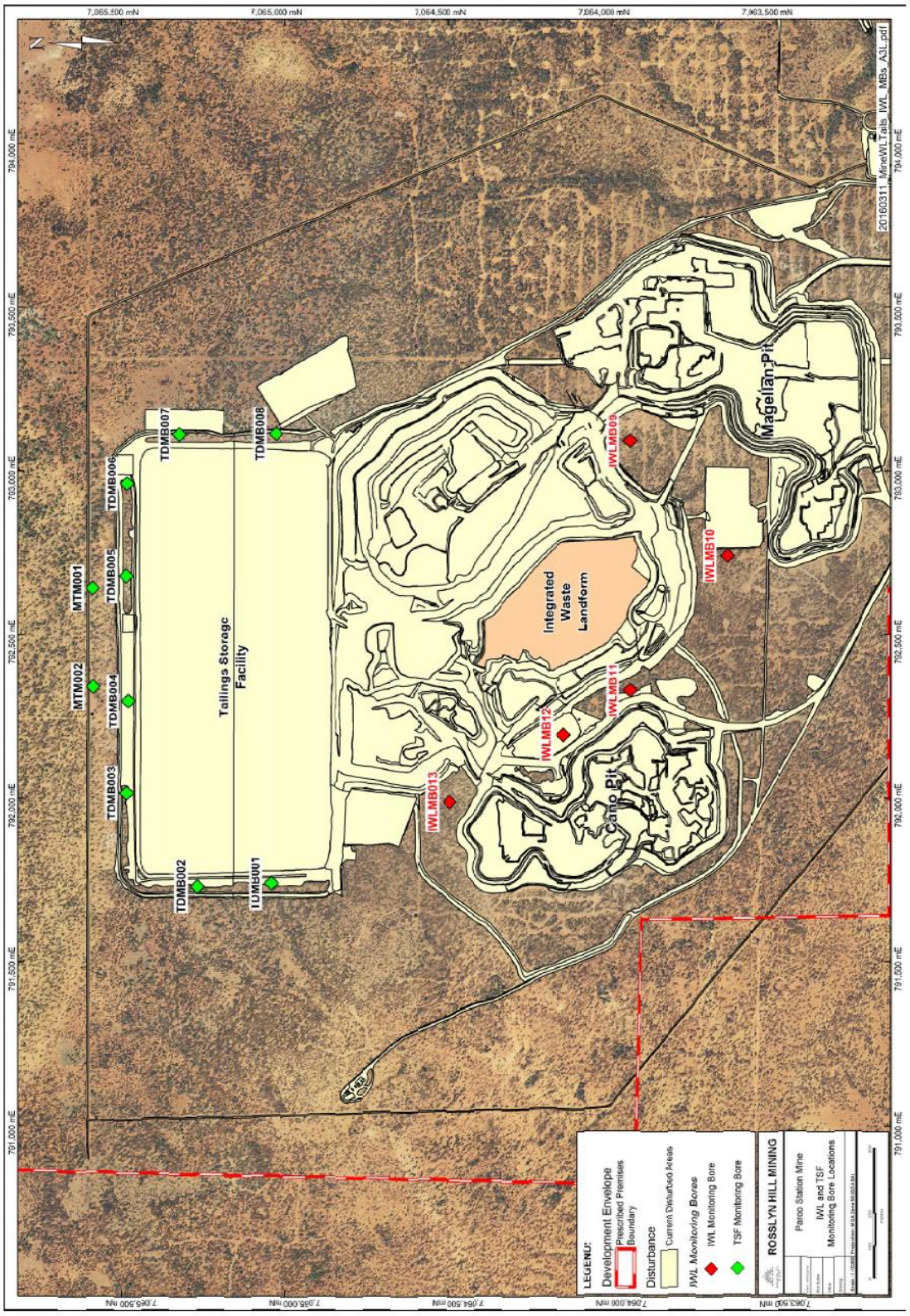

Figure 3: Groundwater monitoring sites within the Premises

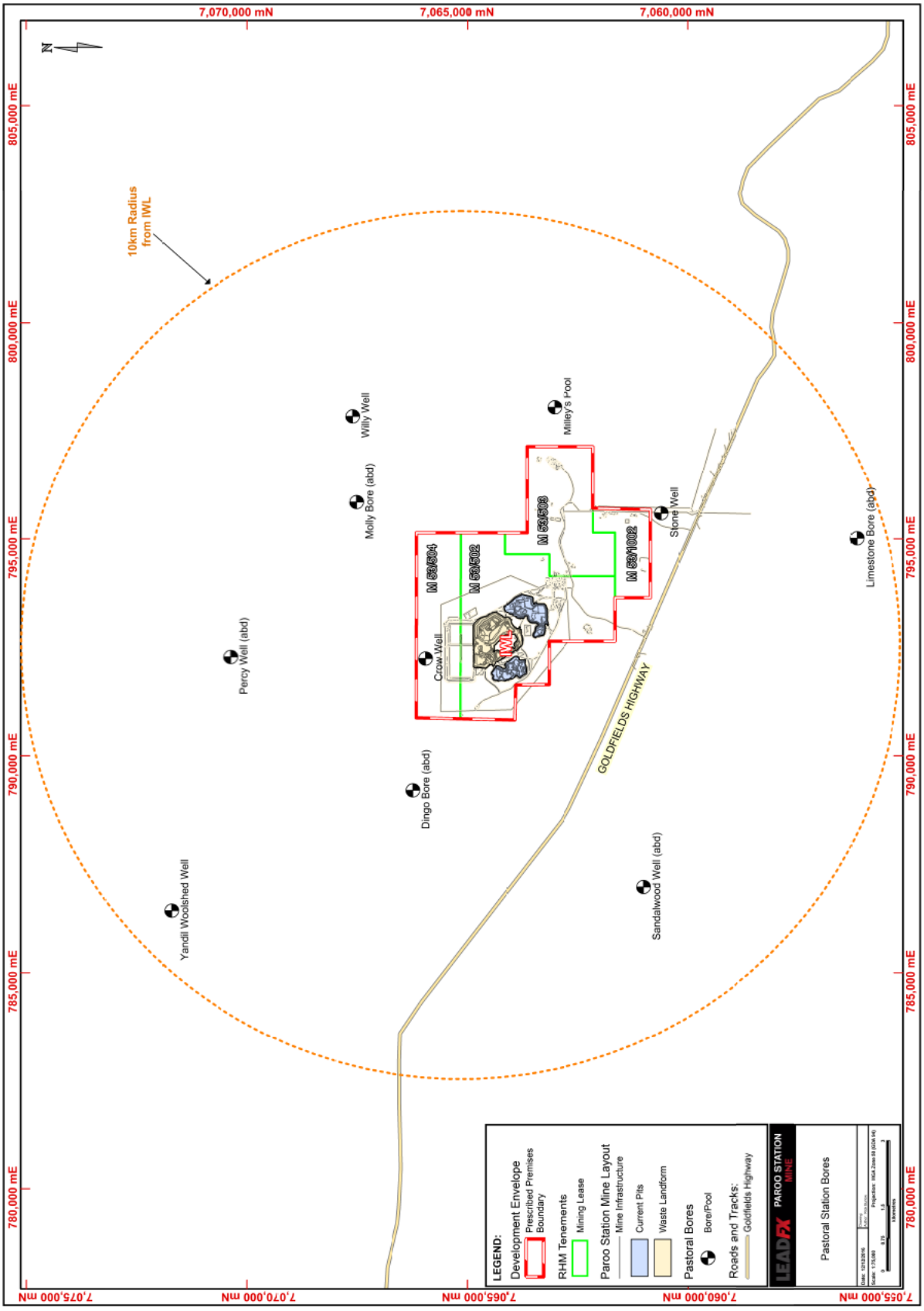

Figure 4: Stock groundwater bores located within a 10km radius of the Premises

Maps of the IWL (Integrated Waste Landform) Design

The design permitted to be constructed as per condition 1.3.6 is shown in Figures 5 -7 following.

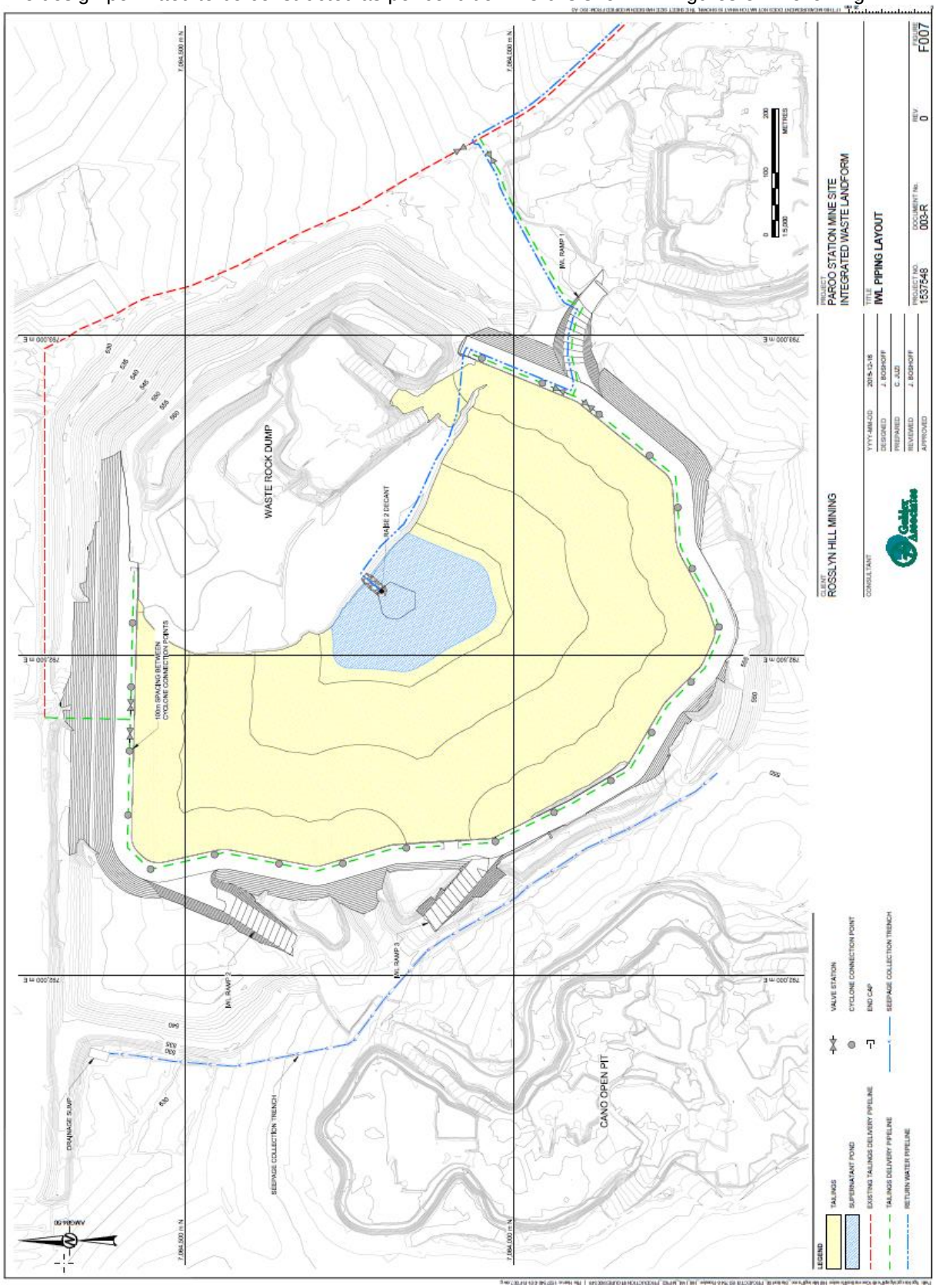

Figure 5: Location of seepage collection trench, drainage sumps and pipework for IWL

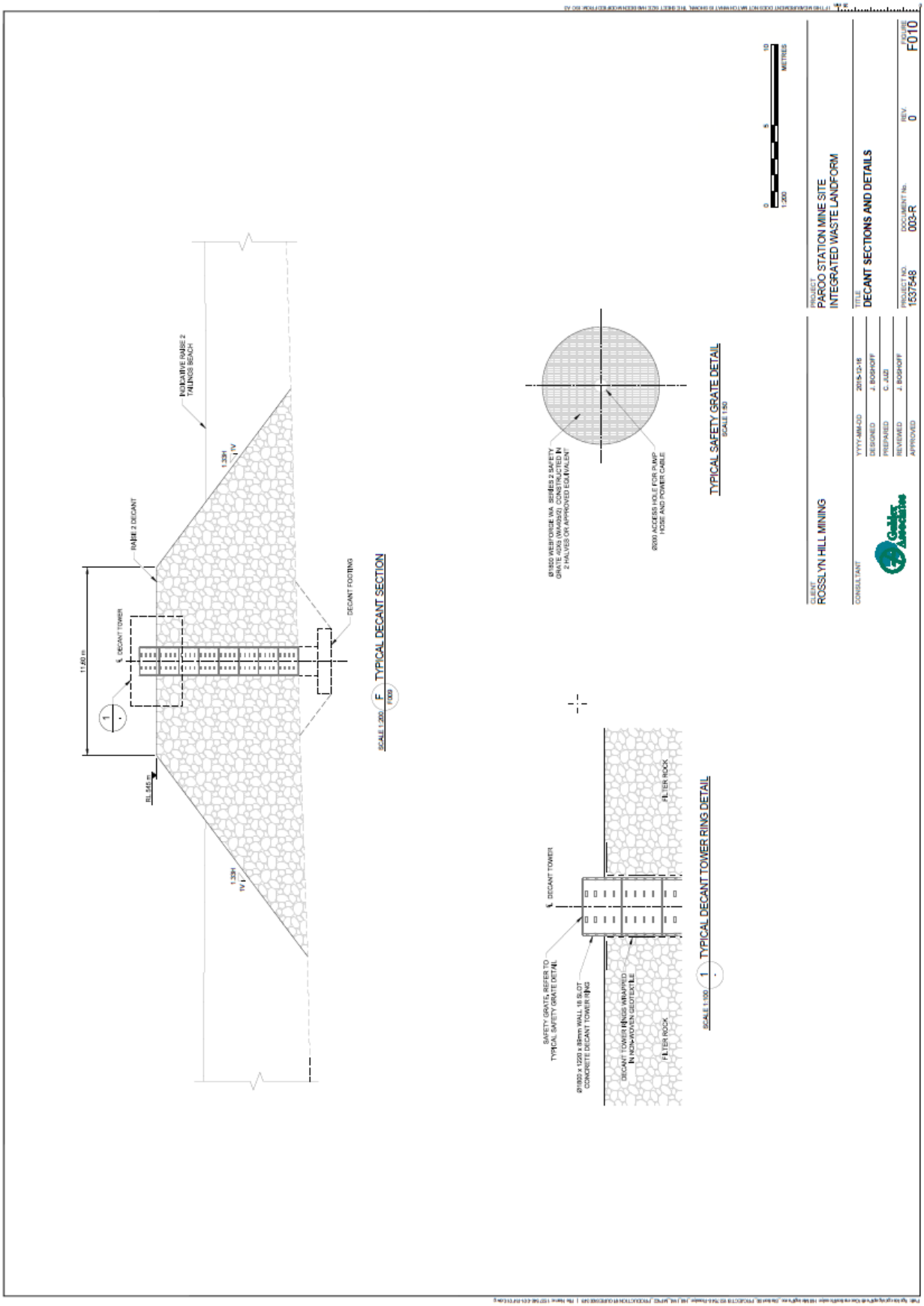

Figure 6: IWL Decant sections and details

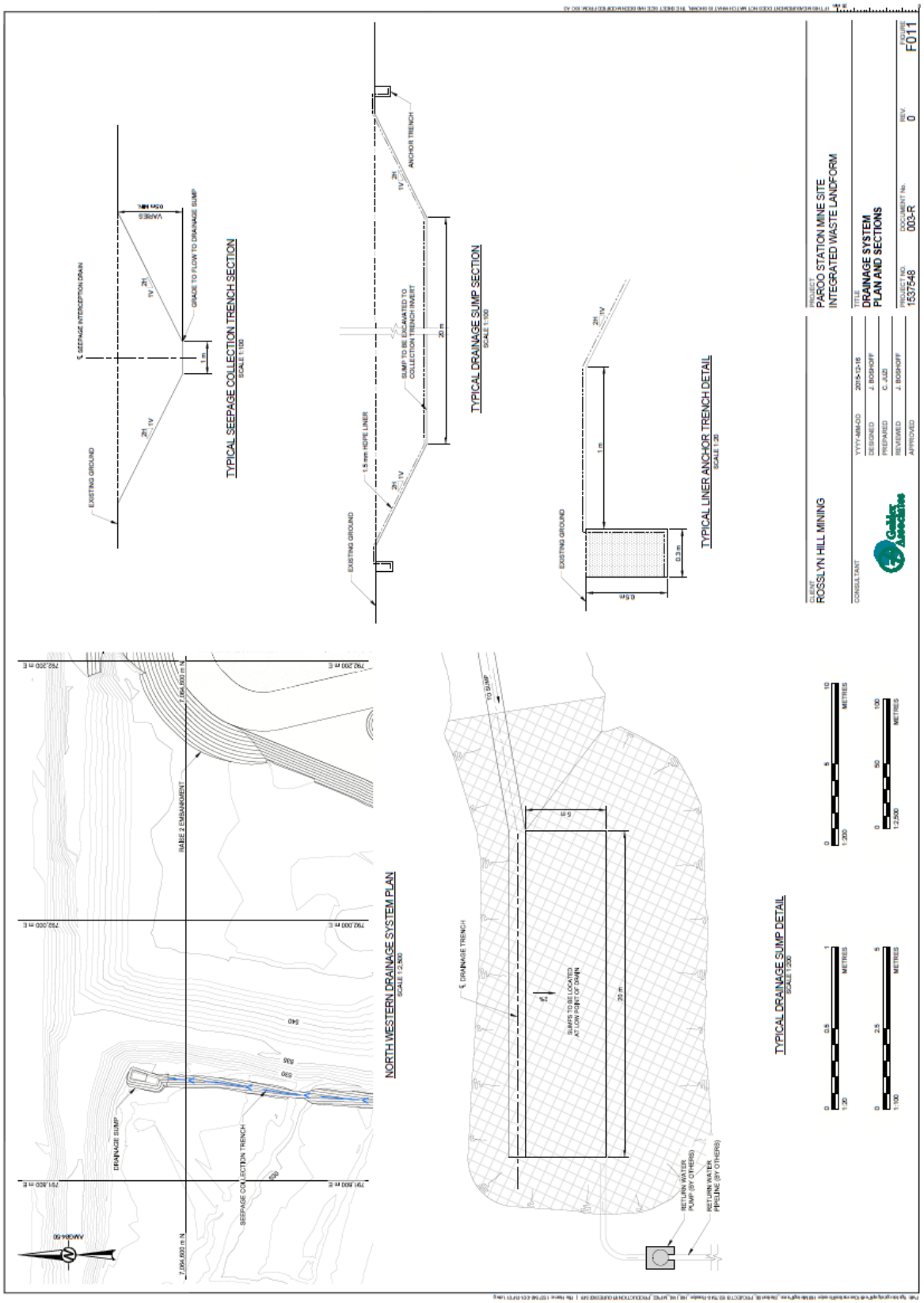

Figure 7: IWL drainage system plan and sections

Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

Licence: L8493/2010/2 Licensee: Rosslyn Hill Mining Pty Ltd
Form: N1 Date of breach:

Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.
Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	

The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of Rosslyn Hill Mining Pty Ltd	
Date	

Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Licensee: Rosslyn Hill Mining Pty Ltd

Licence: L8493/2010/2

Registered office:	Suite 1D, 21 Teddington Road BURSWOOD WA 6100
ACN:	075 523 661
Premises address:	Paroo Station Mine Mining leases M53/502, M53/503, M53/504, M53/1002 and miscellaneous leases L53/106, L53/107, L53/108 and L53/149 WILUNA WA 6646 As depicted in Schedule 1.
Issue date:	Thursday, 28 November 2013
Commencement date:	Friday, 29 November 2013
Expiry date:	Sunday, 28 November 2021

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by:	Louise Lavery Licensing Officer
Decision Document authorised by:	Tim Gentle Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☐ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	5	1,700,000 tonnes per annual period
	85	35 m^3 per day
	89	250 tonnes per year
Application verified Application fee paid	Date: N/A Date:	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	

Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes☒ No☐	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☒ No☐	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☒
Is the proposal subject to Ministerial Conditions?	Yes☒ No☐	Ministerial statement No: 905 EPA Report No: 1415
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☐ No☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

Rosslyn Hill Pty Ltd (Rosslyn Hill) Paroo Station Mine (PSM) is located approximately 30km east of Wiluna in Western Australia. PSM was previously known as the Magellan Lead Project and operated by Magellan Metals Pty Ltd, the former trading name of Rosslyn Hill.

This environmental licence pertains to category 5 (processing and beneficiation of metallic or non-metallic ore) under schedule 1 of the *Environmental Protection Regulations 1987*. The August 2014 licence amendment was the result of an application by Rosslyn Hill to relocate a portion of the tailings pipeline and also increases the frequency of groundwater monitoring in response to an increasing groundwater level trend observed in monitoring data.

PSM is a conventional lead carbonate concentrate processing plant with a capacity to process 1.7 million tonnes per year of lead carbonate ore. The ore is crushed and ground with the resultant slurry passed through a series of agitators and flotation tanks. The produced concentrate is dried then bagged and packed into locked shipping containers for transport (Appendix A).

Waste in the form of tailings was previously pumped along a bunded pipeline corridor to a two-celled paddock style tailings storage facility (TSF) where it is discharged in a manner that maximises solids consolidation and process water return.

The main risks associated with the operation of the processing plant include:

- the potential for seepage of tailings pore water from the TSF into the groundwater; and
- the release of fugitive dust emissions containing lead particulate matter, from exposed surfaces of the TSF, material handling and storage of dried concentrate.

The intent of this Decision Document is to assess the environmental impacts of emissions and discharges associated with the operation of this category 5 premises.

February 2017 Amendment

This amendment authorises the construction and operation of an Integrated Waste Landform (IWL), at Rosslyn Hill Mining's Paroo Station Lead Mine. The IWL is a combined waste rock and Tailings Storage Facility (TSF). Waste rock landforms are utilised to construct the embankments of the IWL, and tailings are then deposited within the embankments.

The IWL is an above ground facility, located to the south of the existing TSF. The embankments will be constructed with two raises: one to RL 545m, and the second to RL 555 m, from a starting height of RL 528 m (total height of 32.2m). The forecast life of the facility is storage of 59 months' worth.

Additionally DER has removed some general conditions, following a review of their validity and enforceability. Categories 85 (sewage treatment) and 89 (landfilling of putrescible waste), previously on Registration R1769, have been transferred to the Licence.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Precribed Premises Categories	Addition of Categories 85 and 89	**February 2017 Amendment** Registration R1769, previously held by the Licensee, authorised category 85 (sewage treatment), 87 (fuel burning) and 89 (putrescible landfill operation). This registration was made inactive as of 15 July 2015 during the period the Licensee was in care and maintenance. Categories 85 and 89 have been added to the Licence.	*Environmental Protection Regulations 1987*
General conditions	Former condition L1.2.1 Former condition L1.2.2	**February 2017 Amendment** DER has reviewed standard condition L1.2.1: *"Nothing in the Licence shall be taken to authorise any emission that is not mentioned in the Licence, where the emission amounts to:* *(a) pollution;* *(b) unreasonable emission;* *(c) discharge of waste in circumstances likely to cause pollution; or* *(d) being contrary to any written law."* and determined it is an explanatory statement designed to provide clarification on the operation of the Licence, and as such is not enforceable. DER has now removed this condition from the Licence. Former condition L1.2.2: *"The Licensee shall operate and maintain all pollution control and monitoring equipment to the manufacturer's specification or any relevant*	DER (2015) *Guidance Statement: Setting Conditions*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		and effective internal management system. " has been removed from the Licence as the pollution control and monitoring equipment that is subject to this condition is not specified and the internal management system is subject to a subjective test of being "effective". Consequently the condition is considered not enforceable as it is not clear.	
	Former condition L1.2.3	Former condition 1.2.3: "*The Licensee, except where storage is prescribed in section 1.3, shall ensure that environmentally hazardous materials are stored in accordance with the code of practice for the storage and handling of dangerous goods."* has been removed from the Licence	
	Former condition L1.2.5	Former condition L1.2.5: *"The Licensee shall implement all practical measures to prevent stormwater run-off becoming contaminated by the activities on the Premises."* has been removed from the Licence as the condition does not specify clearly which stormwater infrastructure is to be utilised or maintained and does not clearly specify which management actions are required to determine compliance with this condition. Existing provisions under the *Environmental Protection Act 1986* are considered to adequately regulate discharges to the environment potentially arising from contaminated stormwater.	
	L1.2.1 (former condition 1.2.4)	**February 2017 Amendment** A modification has been made to the wording of this condition to make it clear that immediate action in response of spills is required for spills which occur outside of secondary containment.	
Premises operation	L1.3.1	**August 2014 Amendment** Refer to Appendix B for the DER's assessment and decision making for risks	Refer to Appendix B

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		associated with operation of tailings pipelines and return pipelines.	
	L1.3.2 L1.3.3 L1.3.4	**August 2014 Amendment** Refer to Appendix B in relation to DER's assessment and decision making for risks associated with the existing TSF. **February 2017 Amendment** Refer for Appendix A for DER's assessment and decision making for risks associated with commissioning and operation of the IWL.	Refer to Appendix B Refer to Appendix A
	L1.3.5 L1.3.6 L1.3.7	**February 2017 Amendment** **Construction** Construction is to meet the works specifications as per Table 1.3.4. Refer to Appendix A for DER's assessment and decision making for risks associated with IWL construction. **Commissioning and Operations** DER's assessment and decision making for risks associated with IWL commissioning and operation is detailed in Appendix A.	Refer to Appendix A
	L1.3.2 L1.3.8	**February 2017 Amendment** DER has authorised the acceptance of waste product material into the IWL in the event of a spillage or release during product transport as part of the contingency planning associated with emergency response for transport incidents.	Letter from B Corry, Rosslyn Hill Mining to T Gentle, DER dated 25 May 2016
	L1.3.9 – L1.3.11	**February 2017 Amendment** Conditions have been added to the Licence to specify the requirements for management of the putrescible landfill, consistent with requirements in the Rural Landfill Regulations 2002. Condition L1.3.9 specifies the landfilling requirements.	*Environmental Protection (Rural Landfill Regulations) 2002*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Condition L1.3.10 specifies the cover material requirements and the timeframe the cover material shall be applied. Condition L1.3.11 specifies the management methods for wind-blown waste.	
Emissions general	L2.1.1	Descriptive limits will be set through condition 3.2.1 of the licence and therefore condition regarding recording and investigation of exceedances of limits has been included. **February 2017 Amendment** A modification to the wording of Licence condition 2.1.1 has been made to ensure that the condition applies to all limits included in the Licence, not just those in section 2.	N/A
Point source emissions to air including monitoring	L – no conditions	**August 2014 Amendment** **Normal operation** No significant point source emissions to air are expected during the operation of the processing plant. No specified conditions relating to point source emissions to air or the monitoring of such emissions are included in the licence. Rosslyn Hill installed a gas fuelled power station under Works Approval W5561/2013/1 issued on 30 January 2014. The generation capacity of this plant is 6.3MW and therefore falls below the threshold to be licenced. There is also a diesel-fired power station at PSM which will remain on site as a contingency option to the gas powered plan.	Application supporting documentation General Provisions of the *Environmental Protection Act 1986*
Point source emissions to surface water	L – no conditions	**August 2014 Amendment** **Normal operation**	Application supporting documentation

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
including monitoring		There are to be no point source emissions to surface water during the operation of the processing plant. The nearest water body is an ephemeral creek system located approximately 3.5km east of the mine site. No specified conditions relating to point source emissions to surface water or the monitoring of such emissions are included in the licence.	General Provisions of the *Environmental Protection Act 1986*
Fugitive emissions	L2.2.1 L3.2.1	Refer to Appendix C for DER's assessment and decision making for fugitive emissions. **February 2017 Amendment** **Construction** DER's assessment and decision making for risks associated with IWL construction is detailed in Appendix A.	Refer to Appendix C Refer to Appendix A
Monitoring general	L3.1.1 – L3.1.3	General monitoring requirements in relation to standards and monitoring frequencies are specified in this section.	General Provisions of the *Environmental Protection Act 1986*
Process monitoring	N/A	There are no process monitoring conditions specified in the Licence.	N/A
Monitoring of inputs and outputs	N/A	There are no conditions specified for monitoring of inputs and outputs in the Licence.	N/A
Ambient quality monitoring	L3.2.1 L3.2.2	Refer to Appendix C for DER's assessment and decision making in relation to monitoring ambient air quality for potential impact from fugitive emissions. **February 2017 Amendment**	Application supporting documentation

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Refer to Appendix A for DER's assessment and decision making in relation to monitoring of ambient groundwater quality and levels for monitoring impacts from the IWL on groundwater and potential third pary receptors (users of groundwater for livestock).	
Meteorological monitoring	N/A	No meterological conditions are specified in this Licence.	N/A
Improvements	Former condition 4.1.1	**February 2017 Amendment** A submission for IR1 was made on 4 September 2014, within the due date of 12 September 2014. Supplementary corrective actions were proposed and closed out with the exception of the installation of vibrating wire piezometers to the north of the TSF. As the active use of the TSF will be replaced with the IWL following its construction and commissioning, DER has determined that the piezometers do not require installation and IR1 can be closed out and removed from the Licence. IR2 has been converted into condition 3.2.2.	Pennington Scott (2014) *Rosslyn Hill Mining TSF Investigation Report Paroo Station Mine*, unpublished report for Rosslyn Hill Mining, 4 September 2014
Information	Former condition 5.1.2	**February 2017 Amendment** Former condition L5.1.2: *"The Licensee shall ensure that:* *(a) any person left in charge of the Premises is aware of the conditions of the Licence and has access at all times to the Licence or copies thereof; and* *(b) any person who performs tasks on the Premises is informed of all of the conditions of the Licence that relate to the tasks which that person is performing.* has been removed from the Licence as this condition has been deemed not enforceable as the requirements for compliance are not clear.	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
	L4.1.2 Removal of AACR template	**February 2017 Amendment** Following DER review of the Annual Audit Compliance Report (AACR) procedure, the template for an AACR has been updated and is now available via DER's public website: der.wa.gov.au. Consequently the template has been removed from the Licence.	DER Guideline: Annual Audit Compliance Reports (August 2016)
	L4.2.2 L4.2.3	**February 2017 Amendment** DER has added conditions (L4.2.2 & L4.2.3) in regard to the submission of a compliance document for each stage of the IWL embankment construction works.	Refer to Appendix A
Licence Duration	N/A	**29 April 2016 Amendment Notice** The duration of the licence was extended to 28 November 2021 on April 29 2016 by amendment notice, to align with the Premises' mining tenement expiry dates.	Sections 59(1)(k) and s59B(9) of the *Environmental Protection Act 1986*

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
02/02/2017	Proponent sent a copy of draft instrument	• Correction to be made to list of tenements; • Clarification of status of the registration and addition of category 85; • Suggested wording change to condition 1.2.1 (spill response times); • Clarification of landfill activity and suggested modification to Table 1.3.5; and • Suggested modification to condition 3.2.2.	Comments adopted with the exception of condition 3.2.2. A revised condition instead drafted and accepted. Category 85 added to the Licence.

6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Appendix A

Premises Operation: Integrated Waste Landform (IWL) including ambient quality monitoring

Construction of the IWL

Emission Description
Emission: Airborne dust from IWL construction activities, from clearing activities, truck movements and deposition of waste rock during construction of embankments.
Impact: Soil contamination from an increased concentration of lead in the surrounding land environment. Possible lead surface water contamination or sediment in lead contamination of nearby creek system (Negri Creek).
Controls: Rosslyn Hill Mining operates in accordance with a Dust Management Plan. Specific controls implemented as part of this plan include:

- operation of water carts for dust suppression;
- use of chemical binders to be sprayed onto dusting surfaces;
- vehicle speeds to be limited to reduce dusting;
- consideration of weather conditions prior to construction commencement and suspension of earthworks in adverse weather conditions; and
- dust monitoring by visual inspection during earthworks.

Risk Assessment
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls
The requirement to conduct activities in accord with the Dust Management Plan has been included as licence condition L2.2.1. The supporting document attached to the IWL proposal is also required to be adhered to, in accord with condition L1.3.5.

Dust generated during operations is managed through these conditions. Management of air quality is supported by an ambient air quality monitoring program required by L3.2.1, using one high volume dust sampler site and 15 dust deposition sites. This ambient air quality program will also monitor any emissions resulting from construction activities.

Residual Risk Assessment
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Normal Operation

Emission Description
Emission: Tailings (pore-water) seepage to groundwater impacting on stock drinking water quality.
Impact: Tailings seepage containing soluble metals, notably thallium, migrating to groundwater bores that are used for livestock drinking water.
Controls: An seepage trench has been installed at the base of the IWL, to collect pore seepage from the west and south embankments.
Groundwater bores to the west, south and east of the IWL will be constructed to allow regular monitoring of groundwater quality surrounding the IWL. These bores are supplemented by the

existing groundwater bores to the north surrounding the existing TSF, which will continue to be monitored to provide a check on groundwater quality. The Licensee has also completed a bore census of the surrounding pastoral groundwater bores within a 10km radius of the mine, to determine whether any bores were currently in use for stock water. This census was required by the previous Licence improvement condition L4.1.1. 10 bores were located, of which 4 are active.

The results of the bore census have been used to set monitoring requirements for the three closest active pastoral bores to the Premises (Willy Well, Crow Well and Stone Well – refer to Table 3.2.2 and Figure 4 of the Licence).

Risk Assessment

Consequence: Moderate. Leachate testing (Golder 2016) conducted according to USEPA LEAF test 1314 methodology indicates that under expected tailings liquid to solid partitioning consistent with the weather conditions experienced at the Premises (high net evaporation rates and low rainfall – typically liquid to solid ratios of 0.2 – 0.5L/kg) metal leachates for all metals and metalloids from the tailings sample analysed met ANZECC water quality criteria for stock drinking water. Thallium in leachate was recorded at concentrations above the maximum contaminant level goal of 0.0005mg/L published in the USEPA's 'National Primary Drinking Water Regulations' which has been nominated by the Department of Health (WA) as an initial health screening tool (USEPA 2009). Thallium in leachate concentrations were 0.0008 mg/L for the 0.5L/kg liquid to solid ratio, and 0.0014 mg/L for the 0.2 L/kg liquid to solid ratio. According to the ANZECC guidelines as there is no current criteria for Thallium for stock water, human drinking water criteria may be adopted as a screening criteria (ANZECC & ARMCANZ 2000). It is noted that this criteria is conservative, however, and the leachate results do not allow for dilution concentration in groundwater which may be 10 times less than the leachate results.

Lead concentrations in leachate were recorded well below the current licence limit of 0.1 mg/L (0.021 mg/L for 0.5 L/kg liquid to solid ratio and 0.04 mg/L for 0.2 L/kg liquid to solids ratio).

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

Condition 1.3.6 has been added to Licence to ensure that the IWL is constructed as per the submitted design.

Condition 1.3.7 requires an annual water balance to be completed over the inflows and outflows of the IWL, to ensure that the seepage recovery via the seepage trench is effective and that vertical seepage through to the underlying aquifer is not increasing over time.

Table 3.2.2 of Condition 3.2.1 requires monitoring of groundwater quality from the groundwater bores surrounding the IWL and the existing groundwater bores to the north of TSF1 and TSF2.

Due to the toxicity of thallium and the concentrations recorded in the tailings leachate results, thallium has been added to the list of parameters required to be monitored. A limit has not been prescribed for thallium at this time. Data gathered from the forthcoming monitoring program will be utilised to determine if a limit is required in the future.

Three active pastoral groundwater bores located within the 10 km radius of the Premises are required to be monitored on an annual basis to ensure that stock water quality is maintained within applicable criteria and also to provide background data on the groundwater quality for potential receptors.

Residual Risk Assessment

Consequence: Moderate

Likelihood: Rare

Risk Rating: Moderate

Normal Operation

Emission Description
Emission: Tailings (pore-water) seepage to groundwater impacting on vegetation.
Impact: Tailings liquors creating mounding in the vicinity of the IWL that causes the existing groundwater level to rise above one metre below ground level, impacting on vegetation.
Controls: A seepage collection trench to the west and south, downstream of the IWL embankments has been installed to capture seepage (Golder 2015). 5 groundwater bores surrounding the IWL will be constructed to allow for monitoring of groundwater quality and groundwater levels, 3 of which are down gradient of the seepage collection trench.

Risk Assessment
Consequence: Moderate
Likelihood: Possible, modelling of groundwater seepage from the previous TSF (which is located to the north of the IWL and down gradient of the proposed IWL) indicated that groundwater mounding (due to a combination of seepage and recharge) had the potential to breach a 1 mbgl standing water level limit (that is included on the Licence). Hydrogeological investigations have identified areas of gravels and highly fractured and weathered bedrock underlying the IWL.The IWL water balance indicates potential seepage losses of up to 40% of inflows (without accounting for seepage recovered from the underdrainage system). The IWL is located higher in the landscape than the previous TSF, however and consequently the depth to groundwater is greater, approximately 10 mbgl (Golder 2015).
Risk Rating: Moderate

Regulatory Controls
Condition 1.3.6 has been added to the Licence to ensure that the IWL is constructed as per the submitted design.
Condition 1.3.7 requires an annual water balance to be completed over the inflows and outflows of the IWL, to ensure that the seepage recovery via the seepage trench is effective and that vertical seepage through to the underlying aquifer is not increasing over time.
Table 3.2.2 of Condition 3.2.1 requires monitoring of the levels in groundwater from the groundwater bores surrounding the IWL and the existing groundwater bores to the north of TSF1 and TSF2.

Residual Risk Assessment
Consequence: Moderate
Likelihood: Unlikely
Risk Rating: Moderate

Emergency Operation

Emission Description
Emission: Release of supernatant liquors or tailings from the IWL due to overtopping during a high rainfall event.
Impact: Tailings solids and liquors containing metals and metalloids including lead (solids approximately 1% lead and liquor lead concentration of ~1-3 mg/L) released to land (DE Cooper & Associates 2000). Soil contamination and potential to impact adjacent vegetation and fauna.

The IWL is located to the south of the existing TSF1 and TSF2 and surrounded by waste rock landforms and pits to the west, east and south east. The only vegetated area that may be impacted is to the south of the IWL.

Controls: Rosslyn Hill have a limit for total freeboard of 500 mm, in addition to provision for a 1 in 100 year, 72 hour duration storm event. The expected rainfall for a in 1% Annual Exceedance Probability (AEP) (equivalent to a 1 in 100 year) event over 72 hours is 235 mm. An additional 300mm has been

allowed for the 1:10 AEP wind and wave run-up. Therefore the maximum operating level of the IWL has been restricted to at least 0.8m below the top of the embankment.

Rosslyn Hill have also given an undertaking to conduct daily visual inspections of the embankment freeboard.

Risk Assessment
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Regulatory Controls
The requirement to maintain a total freeboard of 500mm or freeboard to contain a 1% AEP, 72 hour rainfall event (whichever is the greater) is included on the Licence as condition L1.3.3. Golders (2015) have classed the Rosslyn Hill IWL as a 'high C' consequence facilty for dam failure in accordance with the ANCOLD guidelines (ANCOLD 2012). A 'high C' consequence recommends a freeboard provision to accommodate a 1 in 100 AEP 72-hour rainfall event.

Condition L1.3.4 requires daily visual inspections of the freeboard on the TSF cells to take place.

Residual Risk Assessment
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Normal Operation

Emission Description
Emission: IWL tailings supernatant liquor ingestion by wildlife (birds).
Impact: Thallium and mercury concentrations in the supernatant may result in adverse health impacts for birds drinking supernatant. The salinity of the supernatant is brackish (~5000 mg/L)and pH near neutral (~7.5) (Golder 2015).
Controls: Rosslyn Hill has committed to minimising the size of the supernatant pond, and to maximise the water return to the processing plant. Tailings deposition will be rotated between the discharge points to avoid the development of a long supernatant pond. In the event that the pond level exceeds the maximum operating level (freeboard level) due to a plant malfunction (for example return pump failure) efforts will be made to promptly reduce the water level to at least 0.8m below the lowest embankment crest level of the IWL.

Risk Assessment
Consequence: Moderate
Likelihood: Possible, data is not presently available to assess the risk definitively.
Risk Rating: Moderate

Regulatory Controls
Licence condition 1.3.4 has included the requirement to monitor daily the presence of wildlife on the IWL or in the vicinity.

References

ANZECC & ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Australian National Committee on Large Dams (ANCOLD) (2012) *Guidelines on Tailings Dams: Planning, Design, Construction, Operation and Closure*, May 2012.

DE Cooper & Associates (2000) *Magellan Lead Project, Proposed Tailings Storage and Waste Rock Stockpile Notice of Intent 3327*, May 2000.

Golder Associates (2015) *Rosslyn Hill Mining Pty Limited: The Design Report for Integrated Waste Landform at Paroo Station Mine Site*, December 2015.

Golder Associates (2016) Technical Memorandum to Tom Cooper Rosslyn Hill Mining: Tailings Leachability Assessment, Document No:1537548-004-M-Rev4, 10 February 2016

USEPA (2009) National Primary Drinking Water Regulations, May 2009.

Appendix B

Premises Operation:Tailings Delivery and Return Pipelines

Emergency operation

Emission Description
Emission: Tailings and decant water are transported in pipelines between the processing plant and the TSF. Emission would occur if pipelines rupture and /or leak. Tailings are expected to be pH neutral, contain a lead concentration of approximately 1-3mg/L and total dissolved solids (TDS) between 1500mg/L and 2500mg/L.
Impact: Potential contamination of surrounding soils and damage to vegetation. Localised alteration of the environment would occur due to tailings composition including lead.
Controls: Adequate siting, design, construction and maintenance of pipelines. Tailings and return pipelines are all contained within bunded corridors, are regularly inspected and have telemetry systems in place. Inspections are recorded. Proponent has good physical and management controls in place.

Risk Assessment
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Regulatory Controls
Condition L1.3.1 has been added to ensure environmentally hazardous materials (e.g. tailings/decant water) are adequately contained and managed and that corrective action is taken in the event that pipelines leak or rupture.
Condition L1.3.4 requires daily inspections of the integrity of the tailings and return water pipelines to be completed and recorded in a written log; with the record signed by the person responsible.

Residual Risk
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Premises Operation:Tailings discharge to TSF1 and TSF 2

Emergency operation

Emission Description
Emission: Tailings are discharged to and contained within TSF cells 1 and 2. Emission would occur only if TSF cells overtopped or failed.
Impact: Potential contamination of surrounding soils and vegetation. Erosion of surrounding soils. Localised alteration of the environment would occur due to tailings composition including lead.
Controls: Engineered containment cells, qualified operators and inspectors, regular inspections. Inspections are recorded. Both TSF cells are contained within a secondary, outer bund. Tailings are discharged into TSF cells 1 and 2 in a manner which maximises decant water return to the processing plant.

Risk Assessment
Consequence: Moderate

Likelihood: Unlikely
Risk Rating: Moderate

Regulatory Controls
Conditions 1.3.2 – 1.3.4 have been added to ensure that the transport, storage and management of environmentally hazardous materials (e.g. tailings/decant water) is conducted in a way which minimises the potential for environmental impact.

Residual Risk
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Normal Operation

Emission Description
Emission: Seepage to groundwater from operation of the Tailings Storage Facility (TSF).
Impact: Medium to long-term impacts to groundwater levels and quality, to vegetation health and potentially to other water users (e.g. stock watering). Seepage to groundwater from the TSF is considered significant given the shallow nature of the water table surrounding the TSF. Monitoring data shows a response in groundwater levels to operation of the TSF as well as from rainfall events but the trigger value for lead has not been exceeded (0.1mg/L).
Controls: Rosslyn Hill has committed to the following infrastructure and management practices:

- Seepage interceptor drainage pit around the northern and western boundaries of the TSF;
- Decant of supernatant water for return into the processing circuit;
- Groundwater monitoring using nine groundwater monitoring/recovery bores to monitor the groundwater metals content and the standing water level (SWL).

Risk Assessment
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls
Potential impacts are minimised and investigated through the following regulatory controls:

- L1.3.1 to ensure adequate transport and containment of environmentally hazardous materials;
- L1.3.2 – 1.3.3 to specify containment locations and TSF management;
- L1.3.4 to ensure infrastructure is inspected, records kept, and that corrective action is taken if adequate environmental protection is not being maintained;
- L3.8.1 (Table 3.8.2) has been added to this licence to monitor seepage impacts to groundwater and to impose a limit on groundwater level and lead content; and
- L 4.1.1, IR1 was included in the licence to ensure that future decision making by DER regarding the management and development of the TSF is informed; based on data that is sufficient in quantity and quality and meets targeted objectives. This has been closed oit as of the Ferbuary 2017 amendment and IR2 converted into condition 3.2.2.

Residual Risk
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Appendix C

Fugitive Emissions

Normal Operation

Emission Description

Emission: Dust emissions can be generated from mining of lead ore, materials handling, ore stockpiles, operation of the processing plant (e.g. crushing and screening), and transport on the conveyor belt to the semi-autogenous grinding (SAG) mill, movement of vehicles and open areas.
Impact: Dust emissions can be harmful to human health and the environment. Elevated total suspended particulates (TSP) can impact ambient environmental quality resulting in amenity impacts and can smother vegetation. Particulate matter that is less than 10 (PM_{10}) or 2.5 ($PM_{2.5}$) micrometres in diameter can be drawn deep into the lungs causing human health impacts. The chemical and physical properties of the particles, the size of the particles and the duration of exposure are all factors which may affect human health impacts.
Dust containing lead concentrate particles is readily deposited within the environment, is bio-available and can cause both smothering of vegetation and serious human health impacts (available through both the respiratory and ingestion pathways). Lead contamination of soils from lead dust would represent a long-term alteration of the environment.
Controls: To manage and control fugitive dust emissions containing lead particulate from the prescribed premises, Rosslyn Hill has committed to the following infrastructure and management practices:

- Fully enclosed concentrate drying and loading shed fitted with a vertical plate pressure filter that reduces the moisture content of concentrate from the processing plant to a desired minimum of 7.5% prior to bagging in accordance with Ministerial Statement 905 condition 4.4, which has eliminated the need for a solar drying pad;
- Use of ¾ covers on conveyors to minimise potential dust emissions during operation of the processing plant;
- Ambient air quality monitoring using one high volume dust sampler and 15 static dust deposition gauges;
- Annual vegetation monitoring to asses potential lead uptake and dust coating;
- Use of water carts to reduce windblown dust from material handling, process and stockpile areas;
- Transport of lead concentrate from the site in sealed bags contained within sealed sea containers in accordance with Ministerial Statement 905 condition 4; and
- Dust Management Program prepared by Coffey Natural Systems Pty Ltd dated December 2007.

In addition, water sprays are employed on haul roads and strict hygiene rules are implemented on site to reduce entrainment of lead (e.g. separate clean and dirty area vehicles; separate clean and dirty area clothing and change areas). However complete dust control is difficult (e.g. blasting).

Risk Assessment
Consequence: Major
Likelihood: Unlikely
Risk Rating: Moderate

Regulatory Controls

February 2017 Amendment

Previous conditions 2.6.1 and 2.6.2 have been deemed by DER to be not sufficiently specific so as to apply to the individual risk at a specific premises. Consequently condition 2.6.1 has been replaced

with condition 2.2.1 which requires the Licensee to apply the management controls listed above and also referenced in Table 3 of Section 6 of the April 2015 Rosslyn Hill Mining Dust Management Plan.

Ambient air monitoring through depositional dust gauges and a high volume sampler is required by condition 3.2.1.

Residual Risk
Consequence: Major
Likelihood: Unlikely
Risk Rating: Moderate