Government of Western Australia
Department of Environment Regulation

Licence

Environmental Protection Act 1986, Part V

Licensee: St Barbara Limited

Licence: L8337/2009/2

Registered office: 1205 Hay Street
WEST PERTH WA 6005

ACN: 009 165 066

Premises address: Gwalia Mine
Mining Tenements: G37/25, G37/26, G37/27, M37/17, M37/25, M37/55, M37/137, M37/170, M37/200, M37/247, M37/251, M37/333, M37/391, M37/903, M37/1026, M37/1027, L37/33, L37/34, L37/35, L37/36, L37/56, L37/58 and L37/66
LEONORA WA 6438
as depicted in Schedule 1.

Issue date: Friday, 7 February 2014

Commencement date: Sunday, 9 February 2014

Expiry date: Thursday, 8 February 2029

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	50,000 tonnes or more per year	1,500,000 tonnes per annual period
6	Mine dewatering	50,000 tonnes or more per year	2,500,000 tonnes per annual period
52	Electric power generation: premises (other than premises within category 53 or an emergency or standby power generating plant on which electrical power is generated using a fuel.	10MW or more in aggregate (using a fuel other than natural gas)	12 MW
73	Bulk storage of chemicals, etc.	1,000 cubic meters in aggregate	1,000 cubic meters
89	Putrescible landfill	More than 20 but less than 5,000 tonnes per year	5,000 tonnes per annual period

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

Date signed: 9 December 2016
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Tim Gentle
Manager Licensing (Resource Industries)
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
The Gwalia minesite was established in 1897 as an open pit gold mine, now operating underground, and has produced over 4 million ounces of gold. Gwalia is located three kilometres south of the town of Leonora and has been owned by St Barbara Limited since March 2005.

Ore processing
Ore is trucked to the Gwalia processing plant in Leonora. The processing plant has a three stage crushing, one stage milling circuit with one designated leach tank and 7 adsorption tanks. Tailings are thickened and sent to the tailings storage facility (TSF).

Mine dewatering
Mine dewatering is undertaken as needed and abstracted water is sent to Tower Hill Pit, an ex-mine void, where it is allowed to evaporate and/or be reused in the processing circuit. Lake Raeside is kept as a back-up disposal area for the operations, in case of unforeseen events. Groundwater abstracted from mining activities and the groundwater below the disposal areas is similar in values, therefore little impact is expected from the dewatering.

Power Generation
The power station comprises 4 x 600 kW dual fuel generators (diesel and gas) and 7 x 1200 kW gas generators. It is rated at 15 MW but is able to generate a peak of 12 MW. Waste heat is recovered from the gas generators' exhaust gases via an absorption chiller from which the exhaust gases are released to air. The dual fuel generators release exhaust gases directly to air.

Bulk storage of chemicals
Bulk storage of fuel and lubricant hydrocarbons occur onsite. The majority of fuels and lubricants are located in a dedicated-storage laydown area on a concrete bund. Wastewater generated at the main workshop and wash bay area is treated by an Ultraspin centrifugal oil/water separator. Wastewater at other fuel storage areas is treated by coalescing plates oil/water separators.

Putrescible landfill
General waste from office and mining activities such as plastics, paper and used tyres are disposed of at the landfill. Non-conforming waste such as chemicals, hydrocarbons and batteries are separated from the waste stream and disposed of off site by licensed waste disposal contractors.

Emission types associated with the activities conducted onsite include noise, dust, putrescible waste, tailings, tailings seepage and mine dewater.

November 2016 Amendment

This Licence is the result of an amendment sought by the Licensee to authorise construction and operation of a new Class II landfill, authorise construction of a new Tailings Storage Facility (TSF) TSF4 and update the licence to the new licence format.

The licences and works approvals issued for the Premises since 03/03/1992 are:

Instrument log		
Instrument	**Issued**	**Description**
W777/1988/1	03/03/1992	Works approval
W1176/1988/1	07/12/1994	Works approval
L6059/1988/1	20/11/2000	New licence issued
L6059/1988/2	20/11/2001	Licence re-issue
L6059/1988/3	20/11/2002	Licence re-issue
L6059/1988/4	20/11/2003	Licence re-issue
L6059/1988/5	15/12/2004	Licence re-issue
R1952/2007/1	06/09/2007	Concrete batching registration
L8337/2009/1	09/04/2009	New licence issued – old licence expired
R2097/2009/1	25/09/2009	On site landfill registration
W5324/2012/1	11/02/2013	TSF lift
W5470/2013/1	16/09/2013	TSF3 lift
L8337/2009/2	09/02/2014	Licence re-issue
W5575/2013/1	20/02/2014	Putrescible landfill
W5703/2014/1	29/09/2014	Paste plant stockpiles extension
W5470/2013/1	24/11/2015	Works approval amendment to extend time for TSF 3 Lift
L8337/2009/2	08/12/2016	Licensee amendment to construct and operate new landfill and TSF4 construction

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;*

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

'acceptance criteria' has the meaning defined in Landfill Definitions;

'annual period' means a 12 month period commencing from 1 September until 31 August in the following year;

'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 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters;*

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

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

'CEO' for the purposes of notification means;

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

'clean fill' has the meaning defined in Landfill Definitions;

'Compliance Report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website

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

'Department' means the department established under s.35 of the Public Sector Management Act and designated as responsible for the administration of Division 3 Part V of the *Environmental Protection Act 1986*.

'inert waste type 1' has the meaning defined in Landfill Definitions;

'inert waste type 2' has the meaning defined in Landfill Definitions;

'Landfill Definitions' means the document entitled "Landfill Waste Classification and Waste Definitions 1996 (as amended December 2009) published by the Chief Executive Officer and as amended from time to time;

'Licence' means this Licence numbered L8337/2009/2 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;

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

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

'SWL' means standing water level;

'TSF' means Tailings Storage Facility; and

'µS/cm' means microsiemens per centimetre.

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 Premises operation

1.2.1 The Licensee shall ensure that all pipelines containing tailings slurry, decant water, mine dewater or effluent are either:
(a) equipped with telemetry systems or pressure sensors along pipelines to allow the detection of leaks and failures;
(b) equipped with automatic cut-outs in the event of a pipe failure; or
(c) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

1.2.2 The Licensee shall ensure that tailings, decant water, dewatering water and effluent are only discharged into containment cells, dams and ponds with the relevant infrastructure requirements and at the locations specified in Table 1.2.1.

Table 1.2.1: Containment Infrastructure

Containment identification	Infrastructure requirements
Tailings Storage Facility 3 (TSF3) Eastern and Western Cells	In-situ material
Tower Hill Pit	
Harbour Lights Pit	
Tailings Storage Facility 4 (TSF4)	Underlain by Grant's Patch TSF silty tailings; base permeability of 1×10^{-8} m/s

1.2.3 The Licensee shall manage containment cells and ponds in Table 1.2.1 such that: a minimum top of embankment freeboard of 300mm or a 1 in 100 year / 72 hour duration storm event (whichever is greater) is maintained.

1.2.4 The Licensee shall manage TSF3 and TSF4 such that:
(a) maintain the seepage interceptor drain for TSF3, immediately downstream of the external toe of TSF3, except along the southern toe where it crosses TSF1 and TSF4;
(b) maintain the seepage recovery system for TSF4, once constructed; and
(c) ensure seepage is returned to the TSFs or the process.

1.2.5 The Licensee shall:
(a) undertake inspections as detailed in Table 1.2.2; and
(b) maintain a written log of all inspections undertaken, including the signature of the responsible person for each inspection.

Table 1.2.2: Inspection of infrastructure

Scope of inspection	Type of inspection	Frequency of inspection
Mine dewater pipelines	Visual integrity	Daily when operating or weekly when not operating.
Tailings delivery pipelines	Visual integrity	
Tailings return water lines	Visual integrity	
Internal embankment freeboard of any active TSF	Visual to confirm required freeboard capacity is available	

1.2.6 The Licensee is authorised to construct embankment raises and operate the TSF4 to the heights as listed in Table 1.2.3 below:

Table 1.2.3: Tailings Storage Facility 4 Construction & Operating Heights		
Stages	**Construction Height (m)**	**Supernatant Pond Maximum Operating Height**
Stage 1	371	370.3
Stage 2	373.5	Not authorised at this time
Stage 3	376	
Stage 4	378.5	
Stage 5	381	
Stage 6	383.5	

1.2.7 The Licensee shall construct the embankment raises to the TSF4 and the new landfill in accordance with the documentation detailed in Table 1.2.4:

Table 1.2.4: Construction Requirements[1]		
Document	**Parts**	**Date of Document**
Coffey Mining Pty Ltd – *St Barbara Limited: Gwalia Mine Works Approval Application Tailings Storage Facility 4*. TSF 4 and associated works comprise: • Upstream construction of above ground TSF4 in six lifts of 2.5m on top of Grant's Patch TSFs (GPTSFs) using dried tailings borrowed from GPTSF western cell and mine waste for downstream capping sourced from existing capping layer of GPTSFs. • Downstream seepage recovery system with sump, seepage collection trench and pump on western and southern perimeters of TSF4. • Decant structure including decant well liner and filter rock surrounding decant tower and decant accessway • Tailings delivery and return pipelines and spigots at point of discharge • Six groundwater monitoring bores	Section 5	24 July 2015
Letter from St Barbara Limited to DER entitled "Construction of a Class II landfill at the St Barbara Limited Gwalia mine site waste rock landform on M37/25". Works to be located as shown in Figure 4 in Schedule 1, comprising: • Stage One: excavation of an area 60 m x 40 m for immediate burial of stockpiled waste including tyres. Area to be covered as soon as waste is disposed of to the trench. • Stage Two: Construction of an open trench of no longer than 30 m in length within a fenced area 70 m x 40 m.	All	8 June 2015

Note 1: Where the details and commitments of the documents listed in condition 1.2.7 are inconsistent with any other condition of this Licence, the conditions of this Licence shall prevail.

1.2.8 The Licensee shall ensure that where wastes produced on the Premises are not taken to third party Premises for lawful use or disposal, they are managed in accordance with the requirements in Table 1.2.5. Additional trenches may be constructed and operated as required, providing they are done so in accordance with Table 1.2.5.

Table 1.2.5: Management of waste		
Waste type	**Management strategy**	**Requirements** [1]
Clean fill	Storage, handling and disposal of waste by landfilling	**All waste types** • No more than 5 000 tonnes per year of all waste types cumulatively shall be disposed of by landfilling; • Disposal of waste by landfilling shall only take place within the landfill areas shown on the map of emission points in Schedule 1; • Waste shall be placed in a defined trench, with the active tipping area restricted to a maximum linear length of 70 m and a width of 30 m; • The separation distance between the base of the landfill and the highest groundwater level shall not be less than 3m; and • Must meet the acceptance criteria for Class II landfills.
Inert Waste Type 1		
Inert Waste Type 2		
Putrescible waste		

Note 1: Requirements for landfilling tyres are set out in Part 6 of the Environmental Protection Regulations1987.

1.2.9 The Licensee shall ensure that cover is applied to waste in the tipping area in accordance with Table 1.2.6 and that sufficient stockpiles of cover are maintained on site at all times for the tipping area of the site to be covered, in accordance with this condition, at least twice.

Table 1.2.6: Cover requirements			
Waste Type	**Material**	**Depth**	**Timescales**
Clean Fill	No cover required	N/A	N/A
Inert Waste Type 1	No cover required	N/A	N/A
Inert Waste Type 2	Inert waste type 1, soil or clay	100mm	By the end of the month in which the waste was deposited. Plastic waste with the potential to become windblown shall be covered as soon as practicable after deposit.
Putrescible waste	Inert Waste Type 1, soil or clay	150mm	To be covered by the end of the month in which the waste was deposited with sufficient quantities of Type 1 inert waste, clean fill or other appropriate cover material to prevent the spread of fire and harbouring of disease vectors.

1.2.10 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.

1.2.11 The Licensee may use wastewater potentially contaminated by hydrocarbons for dust suppression, providing it has been treated by an oil/water separator. Treated wastewater or saline water used for dust suppression must not be discharged to native vegetation.

2 Emissions

2.1 Point source emissions to air

2.1.1 The Licensee shall ensure that where waste is emitted to air from the emission points in Table 2.1.1 and identified on the map of emission points in Schedule 1, it is done in accordance with the conditions of this Licence.

Table 2.1.1: Emission points to air

Emission point reference as shown on map of emission points	Emission point height (m)	Source, including any abatement
Gold room furnace stack	10 m	Gold room furnace and gold electrowinning cells via gas scrubber
Carbon regeneration kiln stack x 2	12.5 m	Kiln
Absorption chiller exhaust x 4	12 m	Power plant's waste heat recovery circuit following power generation
Diesel/ gas turbine exhaust x 8	8.5 m	Exhaust from generator
Gas turbine x 16	8.5 m	Two vents per generator: one emergency stack from generator in event waste heat recovery offline and the other for normal venting
Elution boiler exhaust	9 m	Gold Elution circuit

2.2 Point source emissions to surface water

2.2.1 The Licensee shall ensure that where waste is emitted to surface water from the emission points in Table 2.2.1 and identified on the Premises map in Schedule 1, it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Point source emissions to surface water

Emission point reference on Premises map	Description	Source including abatement
Lake Raeside	Salt lake	Dewater from mining activities via sedimentation pond

2.3 Point source emissions to groundwater

2.3.1 The Licensee shall ensure that where waste is emitted to groundwater from the emission points in Table 2.3.1 and identified on the Premises map in Schedule 1, it is done so in accordance with the conditions of this Licence.

Table 2.3.1: Point source emissions to groundwater

Emission point reference on Premises map	Description	Source including abatement
Tower Hill Pit	Dewater disposal (open) pits	Dewater from mining activities
Harbour Lights Pit		

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.

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 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.

3.1.4 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 Monitoring of point source emissions to surface water

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

Table 3.2.1: Monitoring of emissions to surface water

Emission point reference	Parameter	Units	Frequency
Lake Raeside	Volumetric flow	m^3	Cumulative monthly during active discharge period
	pH	-	Monthly during active discharge period
	Total Suspended Solids (TSS), Total Dissolved Solids (TDS), WAD-CN (weak acid dissociable cyanide,)sodium (Na), potassium (K), calcium (Ca),magnesium (Mg), arsenic (As), lead (Pb), nickel (Ni), iron (Fe), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), selenium (Se), zinc (Zn), chloride (Cl), carbonate (CO_3), bicarbonate (HCO_3), sulfate (SO_4) and nitrate (NO_3).	mg/L	

3.3 Monitoring of point source emissions to groundwater

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

Table 3.3.1: Monitoring of emissions to groundwater			
Emission point reference	**Parameter**	**Units**	**Frequency**
Tower Hill Pit Harbour Lights Pit	Volumetric flow	m^3	Cumulative monthly
	pH	-	Six monthly during active discharge period
	TSS, TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO_3, HCO_3, SO_4, and NO_3	mg/L	

3.4 Ambient environmental quality monitoring

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table and record and investigate results that do not meet any limit specified.

Table 3.4.1: Monitoring of ambient groundwater quality				
Monitoring point reference and location	**Parameter**	**Units**	**Averaging period**	**Frequency**[1]
TSF 2/1 to TSF 2/12 Monitoring bores	SWL	Metres AHD	Spot sample	Six monthly
	pH	-		
	TDS	mg/L		
	WAD-CN			
TSF 3/1 to TSF 3/7 Monitoring bores	SWL	Metres AHD	Spot sample	Monthly, while the plant is operating; quarterly while in care and maintenance
TSF 3/1 to TSF 3/8 Monitoring bores	pH	-	Spot sample	Quarterly while the plant is operating; six monthly while in care and maintenance
	TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO_3, HCO_3, SO_4, and NO_3	mg/L		
TSF 4/1 to TSF 4/6 Monitoring bores	SWL	Metres AHD	Spot sample	Monthly, while the plant is operating; quarterly while in care and maintenance
	pH	-	Spot sample	Quarterly while the plant is operating; six monthly while in care and maintenance
	TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO_3, HCO_3, SO_4, and NO_3	mg/L		

Note 1: The new TSF4/1 – TSF 4/6 bores are only required to be sampled following construction.

3.4.2 For annual periods where a dewatering discharge into Lake Raeside has occurred, the Licensee shall prepare a dewatering discharge report that assesses environmental impacts associated with the mine dewater discharge. The assessment shall include:

(a) description of the receiving environment of Lake Raeside, including lake geology, topography, hydrological processes, sediment and water quality and significant flora and fauna;
(b) report on the dewatering discharge volumes and water quality from the Premises;
(c) salt and water balance estimates for the reporting period in relation to the addition of the dewatering discharge from the Premises to Lake Raeside;
(d) sampling of metals in sediments at impacted and non-impacted sites;
(e) an assessment of the impact of the discharge on the receiving environment by comparison of impacted monitoring sites against non-impacted monitoring sites;
(f) an assessment of current results as compared to previous reporting periods; and
(g) summary of findings, conclusions and any recommendations for the improvement of the monitoring program and/or modifications for management of the discharge to reduce impact.

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 60 days after the Anniversary Date, a 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 60 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
Table 3.2.1	Volumetric flow, pH, TSS, TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO_3, HCO_3, SO_4, and NO_3	
Table 3.3.1	Volumetric flow, pH, TSS, TDS, WAD-CN, Na, K, Ca,	

	Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO_3, HCO_3, SO_4, and NO_3	
Table 3.4.1	Volumetric flow, pH, TSS, TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO_3, HCO_3, SO_4, and NO_3	
3.4.2	Dewatering discharge report for discharges to Lake Raeside	
4.1.2	Compliance	Compliance Report
4.1.3	Complaints summary	None specified

4.2.2 The Licensee shall ensure that the Annual Environmental Report also contains:
(a) any relevant process, production or operational data recorded under Condition 3.1.3; and
(b) an assessment of the information contained within the report against previous monitoring results and Licence limits.

4.2.3 For each stage of the TSF4 works described in Table 1.2.3 and Table 1.2.4, and following completion of construction of the landfill described in Table 1.2.4, the Licensee shall submit a compliance document to the CEO.

4.2.4 The compliance document shall:
(a) certify that the works were constructed in accordance with the conditions of this 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.

Schedule 1: Maps

Premises map

The Premises is shown in the map below. The green line depicts the Premises boundary.

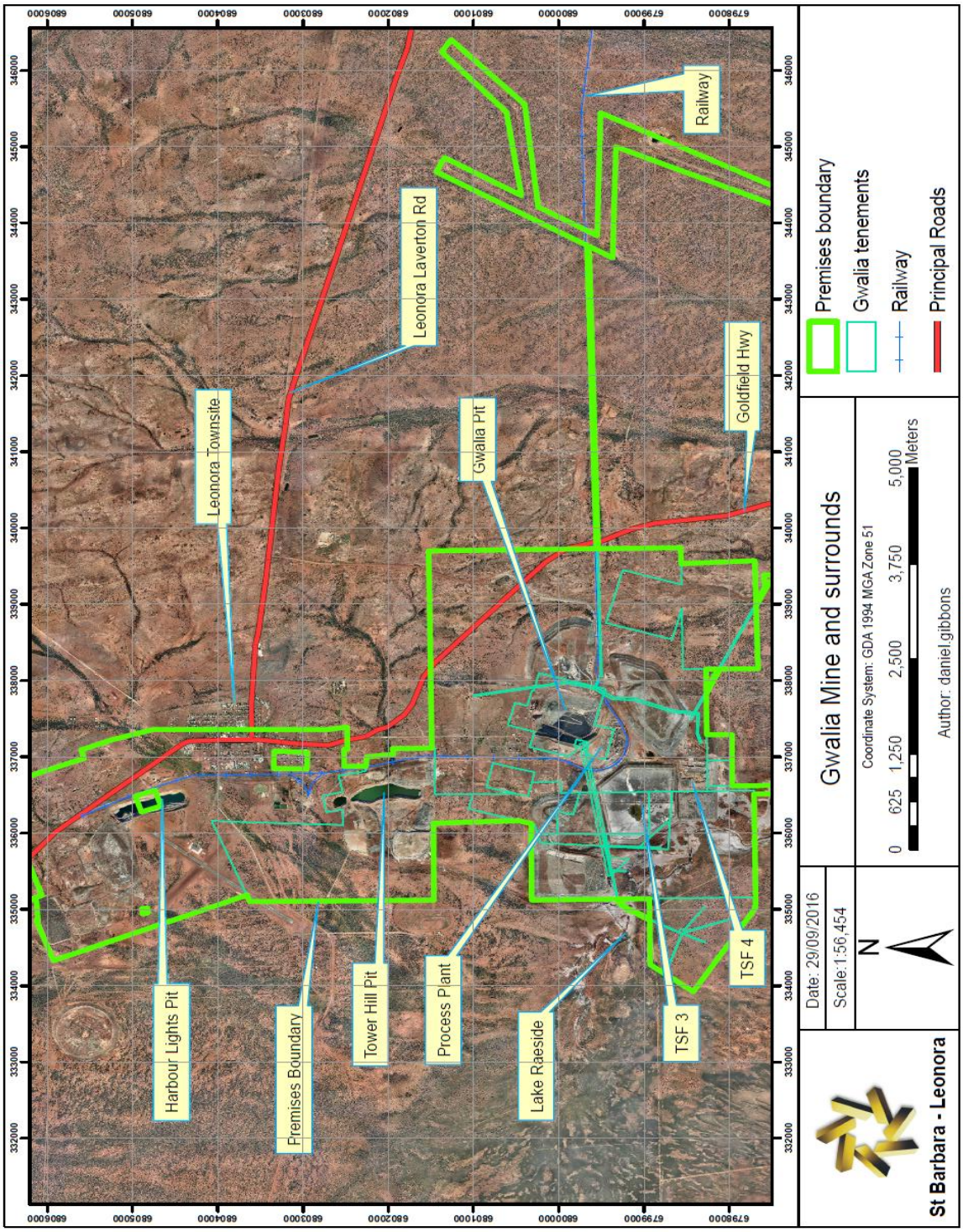

Figure 1: Premises Map

Map of storage locations

The locations of the containment infrastructure defined in Table 1.2.1 is shown in Figure 2 below.

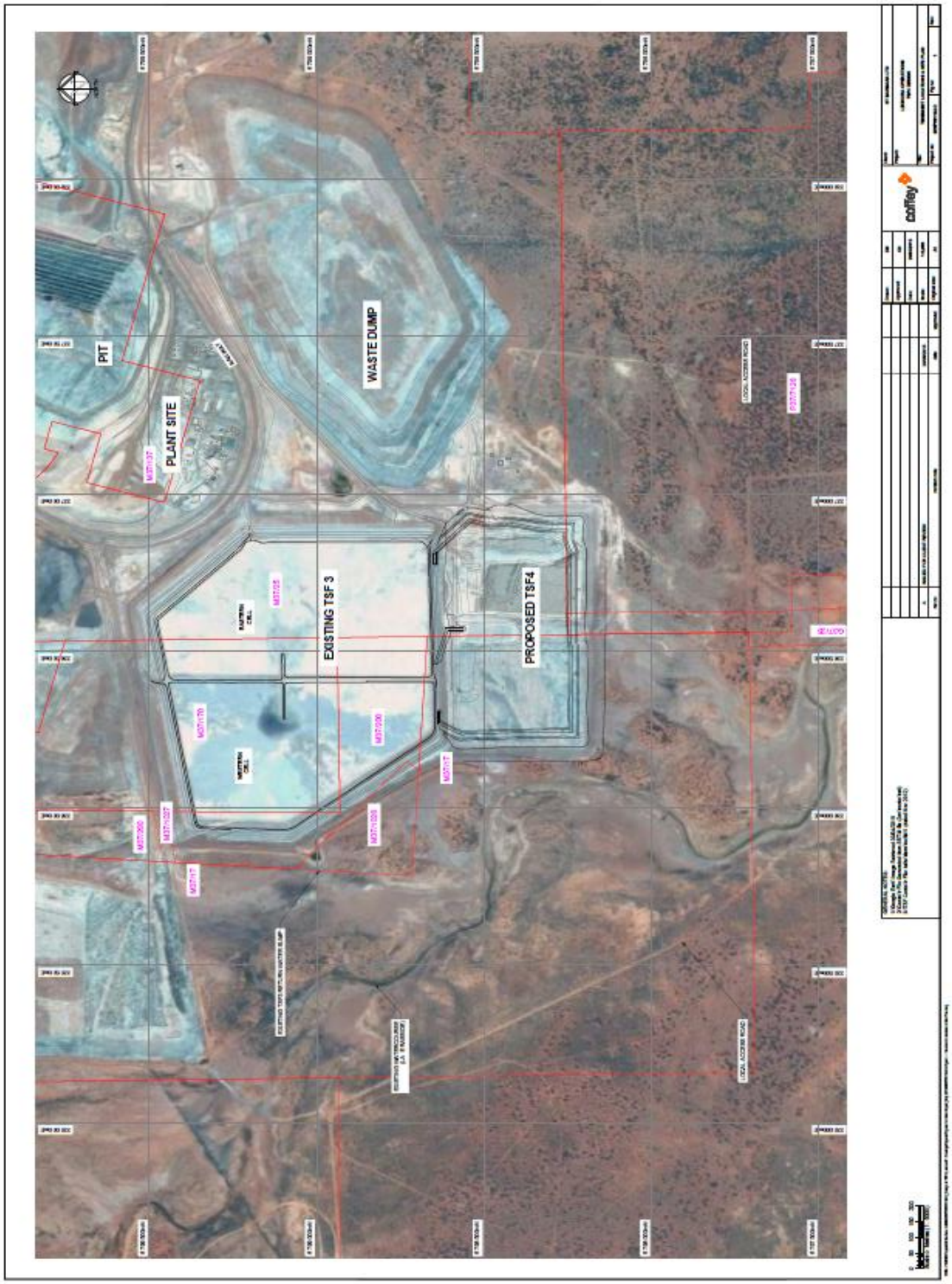

Figure 2: Location of the TSF3 and proposed TSF4

The location of the proposed landfill authorised by condition 1.2.7 is shown in Figure 3 below.

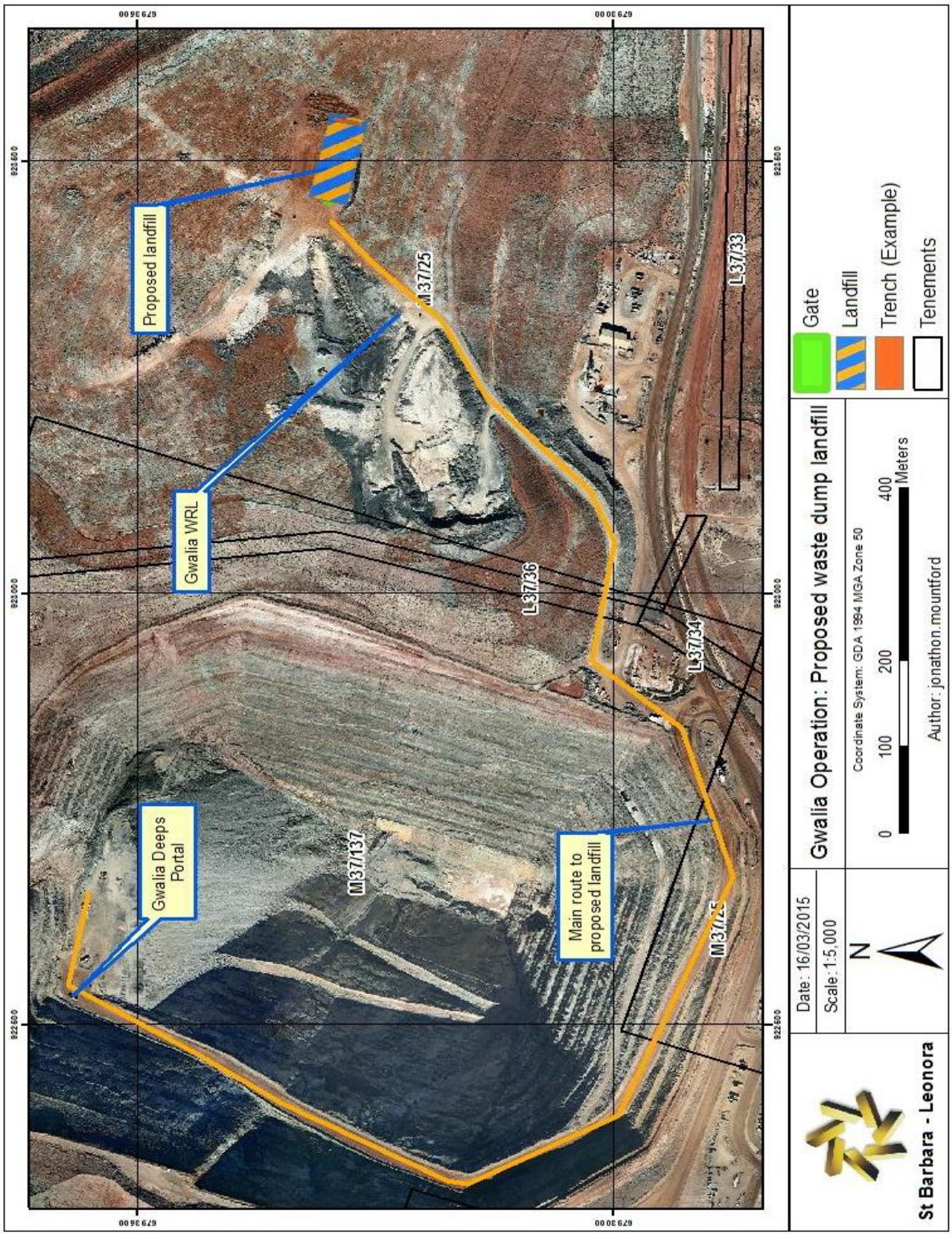

Figure 3: Location of the new proposed landfill adjacent to Gwalia Deeps

The location of the existing landfill as authorised in Table 1.2.5, condition 1.2.8, is shown below.

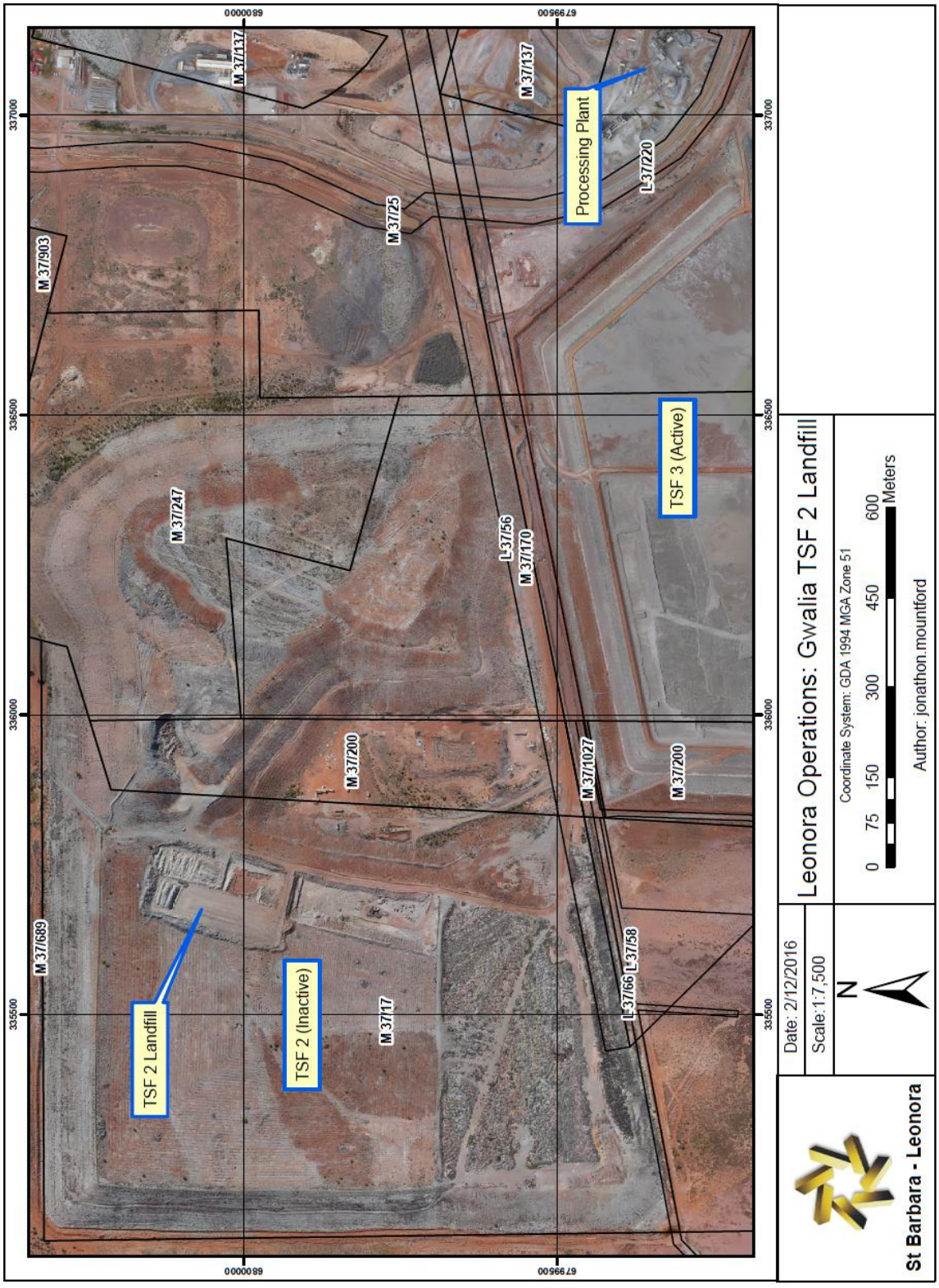

Figure 4: Location of the existing landfill on TSF2.

Map of emission points to air

The locations of the emission points to air as listed in condition 2.1.1 is shown in Figure 5 below.

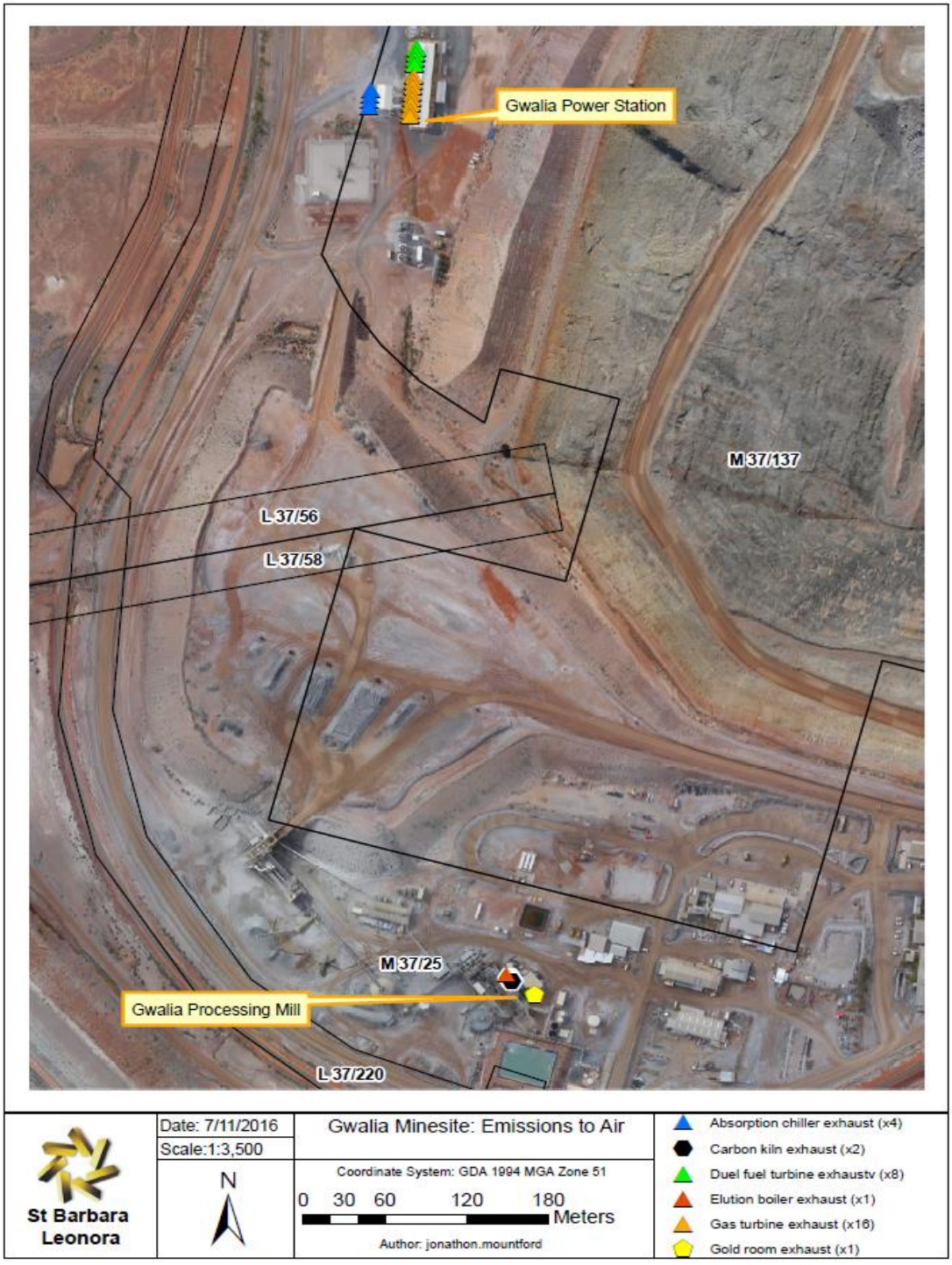

Figure 5: Locations of the emission points to air

Map of monitoring locations

The locations of the monitoring points for TSF 2 and TSF 3, defined in Table 3.3.1 are shown in Figure 6 below.

Figure 6: Location of the groundwater monitoring bores surrounding TSF 2 (decommissioned) and active TSF 3.

The locations of the monitoring points for TSF 4, defined in Table 3.3.1, are shown in Figure 7 below.

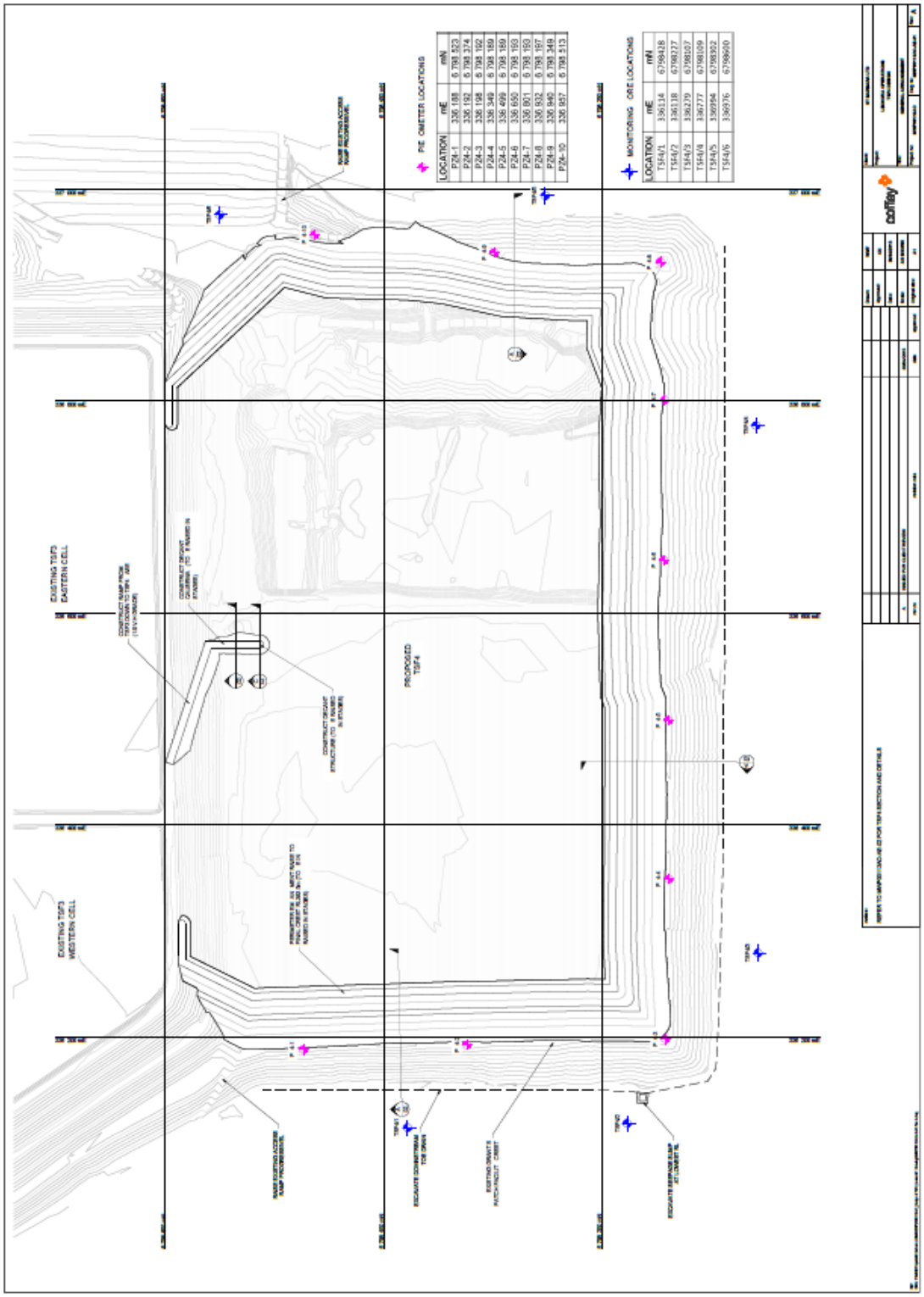

Figure 7: Locations of new groundwater monitoring bores surrounding the new TSF 4, shown in blue.

Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Licensee: St Barbara Limited

Licence: L8337/2009/2

Registered office:	1205 Hay Street WEST PERTH WA 6005
ACN:	009 165 066
Premises address:	Gwalia Mine Mining Tenements: G37/25, G37/26, G37/27, M37/17, M37/25, M37/55, M37/137, M37/170, M37/200, M37/247, M37/251, M37/333, M37/391, M37/903, M37/1026, M37/1027, L37/33, L37/34, L37/35, L37/36, L37/56, L37/58 and L37/66 LEONORA WA 6438 as depicted in Schedule 1.
Issue date:	Friday, 7 February 2014
Commencement date:	Sunday, 9 February 2014
Expiry date:	Thursday, 8 February 2029

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue a licence. DER considers that in reaching this decision, it has taken into account all relevant considerations.

Decision Document prepared by:	Louise Lavery Senior 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

<table>
<tr><th colspan="3">Administrative details</th></tr>
<tr><td>Application type</td><td colspan="2">Works Approval ☐
New Licence ☐
Licence amendment ☒
Works Approval amendment ☐</td></tr>
<tr><td rowspan="6">Activities that cause the premises to become prescribed premises</td><td>Category number(s)</td><td>Assessed design capacity</td></tr>
<tr><td>5</td><td>1,500,000 tonnes per annual period</td></tr>
<tr><td>6</td><td>2,500,000 tonnes per annual period</td></tr>
<tr><td>67</td><td>In aggregate 2000 kilograms or more (fuel with a sulphur content of less than 0.25%)</td></tr>
<tr><td>70</td><td>50,000 tonnes per annual period</td></tr>
<tr><td>73</td><td>1,000 cubic meters</td></tr>
<tr><td>89</td><td>5,000 tonnes per annual period</td></tr>
<tr><td>Application verified
Application fee paid</td><td colspan="2">Date: N/A
Date: N/A</td></tr>
<tr><td>Works Approval has been complied with
Compliance Certificate received</td><td colspan="2">Yes☐ No☐ N/A☒
Yes☐ No☐ N/A☒</td></tr>
<tr><td>Commercial-in-confidence claim</td><td colspan="2">Yes☐ No☒</td></tr>
</table>

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: EPA Report No:
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

The Gwalia mine site was established in 1897 as an open pit gold mine and has produced over 4 million ounces of gold. Gwalia is located three kilometres south of the town of Leonora and has been owned by St Barbara Limited since March 2005.

The ore is mined underground using a Longhole Open Stoping method.

Ore is trucked to the Gwalia processing plant in Leonora. The processing plant has a three stage crushing, one stage milling circuit with one designated leach tank and 7 adsorption tanks. Tailings are thickened and sent to the tailings storage facility (TSF).

Emission types associated with the activities conducted onsite include noise, dust, putrescible waste, tailings, tailings seepage and mine dewater.

November 2016 Amendment

This Licence amendment is a result of the Licensee applying to construct a new landfill near Gwalia Deeps, and to construct and operate a new Tailings Storage Facility 4 (TSF4) on top of Grant's Patch TSF and the Licence being converted to the new format.

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			
Licence section	**Condition number** **L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Premises Categories	Replacement of category 67 with 52 Removal of category 70	Category 52 Electric Power Generation has been placed on the Licence instead of the previous 67, Fuel Burning. Gwalia Mine operates an onsite power station comprising a mix of dual fuel (diesel and gas) and gas generators. Category 70, Screening, has been removed as the screening activities previously described as occurring as part of ore processing and this is covered by Category 5, already present on the Licence.	*Environmental Protection Regulations 1987*
General conditions	N/A	No additional conditions are deemed necessary under General conditions.	N/A
Premises operation	L1.2.1 L1.2.2 – 1.2.5 Table 1.2.1 Table 1.2.2	L1.2.1 has been added to the licence to ensure pipelines are managed appropriately to reduce the risk impact to vegetation from spills. Refer to Appendix B for DER's assessment and decision making in relation to operation of new pipelines for TSF4. L1.2.2 to 1.2.5 and Table 1.2.1 have been included to ensure the Licensee manages containment infrastructure to limit impact to the environment. L1.2.4 specifies that the seepage recovery systems in place for TSF3 and to be constructed for TSF4, must be maintained and seepage returned to the process or TSFs. These conditions replace previous licence conditions W2(a) – W2(c), W3(a), W5(a), W5(b), W9(a), W9(b) and W16.	*Works Approval Application Tailings Facility 4* Coffey Mining Pty Ltd, 24 July 2015 *Environmental Management System Manual* Revision R5 – St Barbara Limited
	L1.2.6 – 1.2.7 Table 1.2.3 Table 1.2.4	**Operation – TSF4** DER's assessment and decision making is included as Appendix B.	Refer Appendix B

DECISION TABLE			
Licence section	**Condition number L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
	L1.2.8 – 1.2.10	Premises operation conditions have been applied to the amended Licence to regulate the operation of the existing and new landfill. These conditions include requirements for the types of waste permitted, trench size and location, covering regularity of cover placement and recovering of windblown waste. These conditions mirror the requirements of the *Environmental Protection (Rural Landfill) Regulations 2002*. These conditions replace previous licence conditions L1 – L5. **Operation – Landfills** DER's assessment and decision making is included as Appendix A.	Letter from St Barbara Limited to DER dated 8 June 2015. *Environmental Protection (Rural Landfill) Regulations 2002*.
	1.2.11	Following submission from the Licensee, provision for using treated wastewater as dust suppressant is authorised, providing it is applied so as to not damage native vegetation. This condition replaces previous condition W10.	Comments from applicant received 7 October 2016. DER document reference: A133929
Emissions general	N/A	As no limits are prescribed in this Licence, the general condition in relation to adhering to limits is not included in this Licence.	N/A
Point source emissions to air including monitoring	N/A	No significant point source emissions to air occur at the Premises with no adjacent sensitive receptors, hence there are no conditions in this section.	N/A
Point source emissions to surface water including monitoring	L2.1.1 Table 2.1.1 L3.2.1 Table 3.2.1 L3.4.2	As the Licence permits discharge of mine dewater to Lake Raeside as a contingency measure, condition L2.1.1 permits the discharge and conditions L3.2.1 and L3.4.2 prescribe the monitoring required associated with assessing the potential impact of the discharge. It is noted that the Licensee has not discharged dewater to Lake Raeside since 2006 (St Barbara Limited 2015). Conditions L2.1.1, L3.2.1 and L3.4.2 replace previous Licence conditions G4 and part of W6(a).	St Barbara Limited (2015) *Leonora Operations Annual Environmental Report 1 September 2014*

DECISION TABLE			
Licence section	**Condition number L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			– 31 August 2015
Point source emissions to groundwater including monitoring	L2.2.1 Table 2.2.1 L3.3.1 Table 3.3.1	The Licence permits discharge of mine dewater to two open pits, Tower Hill and Harbour Lights. This discharge is considered a point source emission to groundwater. This discharge has not been reassessed as part of this amendment. The monitoring conditions specified in condition L3.3.1 are intended to provide data on the quality of the water being discharged back into the local aquifer.	General provisions of the Environmental Protection Act 1986
Emissions to land including monitoring	N/A	There are no emissions to land authorised by this Licence and hence no conditions in this section.	N/A
Odour	N/A	No significant odour sources are present within the Premises and no sensitive receptors adjacent to the Premises; hence no conditions are specified for odour.	N/A
Noise	N/A	As no conditions were previously applied to the licence for noise, the section has been removed. **Construction and Operation – TSF4** No sensitive receptors are adjacent to the TSF4 works and noise is expected to be minimal in construction and operation, so no conditions are specified.	N/A *Works Approval Application Tailings Facility 4* Coffey Mining Pty Ltd, 24 July 2015
Monitoring general	L3.1.1 to 3.1.4	Generic conditions designed to ensure all sampling done by the Licensee meets NATA and manufacturers' standards.	General provisions of the *Environmental Protection Act 1986*
Monitoring of inputs and outputs	N/A	As no conditions were applied to the previous licence for monitoring of inputs and outputs, the section has been removed.	N/A
Process monitoring	N/A	As no conditions were applied to the previous licence for process monitoring, the section has been removed.	N/A
Ambient	L3.4.1	Licence condition L3.4.1 replaces previous licence condition W6(a) in relation to	

DECISION TABLE			
Licence section	**Condition number L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
quality monitoring	Table 3.4.1	monitoring the impact of seepage from TSF2 (inactive) and TSF3 (active) on groundwater levels and quality. **Operation – TSF4** Refer to Appendix B for DER's assessment and decision making in regard to ambient groundwater monitoring in relation to TSF4.	Appendix B
Meteorological monitoring	N/A	As no conditions were applied to the licence for meteorological monitoring, the section has been removed.	N/A
Information	L4.1.1 – L4.2.2 Table 4.2.1	Conditions and table have been added to the information section of the licence to require the Licensee to submit a Compliance Report (also known as an Annual Audit Compliance Report; AACR) and reporting of information required to be submitted in the Annual Environmental Report (AER).	General provisions of the *Environmental Protection Act 1986*
	L4.2.3 – L4.2.4	Standard conditions for submission of a compliance document following completion of works authorised in Tables 1.2.3 and 1.2.4 is specified in condition L4.2.3. The requirements for the compliance document format are specified in condition L4.2.4. Note that a compliance document is required to be submitted for each stage of the works as listed in Table 1.2.3.	
Licence Duration	N/A	The duration of the licence was extended to 8 February 2029 on 29 April 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
16/09/2016	Proponent sent a copy of draft instrument	Request received to include provision for using treated wastewater as dust suppressant in line with the previous condition W10. Three tenements requested to be added to the premises boundary. Query regarding the application of the premises condition 1.2.1 for controls on pipelines. Minor errors identified. DER additionally queried the current categories on the existing Licence and suggested a review pending information from the Licensee on power generation.	Comments adopted. New condition 1.2.11 added to allow for reuse of treated wastewater for dust suppression. Minor errors corrected. Category 67 replaced with category 52 and category 70 removed from the Licence.
29/11/2016	Proponent sent a revised copy of draft instrument	Three comments received: • Clarifying which generators exhaust to air and which exhausts pass through the absorption chillers; • Correction suggested for condition 1.2.11 authorising treated wastewater reuse in dust suppression; and • Map supplied showing the location of the existing landfill.	Comments adopted.

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

St Barbara Limited (SBM) intends to construct, commission and operate a class II landfill on a historic waste rock landform (WRL) immediately east of the Gwalia Deeps Open Pit as shown in Figure 1 below. The area has been used for temporary stockpiling of waste vent bag material from the underground operations. Originally this material was to be recycled; however that option has not proved feasible and instead SBM will landfill the waste material at the same location. SBM also intends to deposit heavy vehicle tyres to the landfill. These will be disposed of in accord with the Part 6 of the Environmental Protection Regulations

The landfill is proposed to be developed in two stages. Stage One will consist of a short-term excavation to dispose of the existing stockpiled materials and tyres. The area of Stage One will be approximately 60m x 40m. As the material will be immediately buried no fencing is proposed for Stage One.

Stage Two will consist of the long-term landfill, utilising open trenches for waste deposition. The facility's area is approximately 70m x 40m, the length of the individual trenches will not exceed 30m in length and be opened and closed sequentially so only one trench is open at any time. Refer to Figure 2 below. This section of the landfill will be fenced to prevent unauthorised access and ensure windblown wastes are retained at the landfill. The main wastes deposited into the stage 2 landfill are vent bag material, plastics, unsalvageable steel along with small amounts of putrescibles from the Gwalia Deeps underground operation.

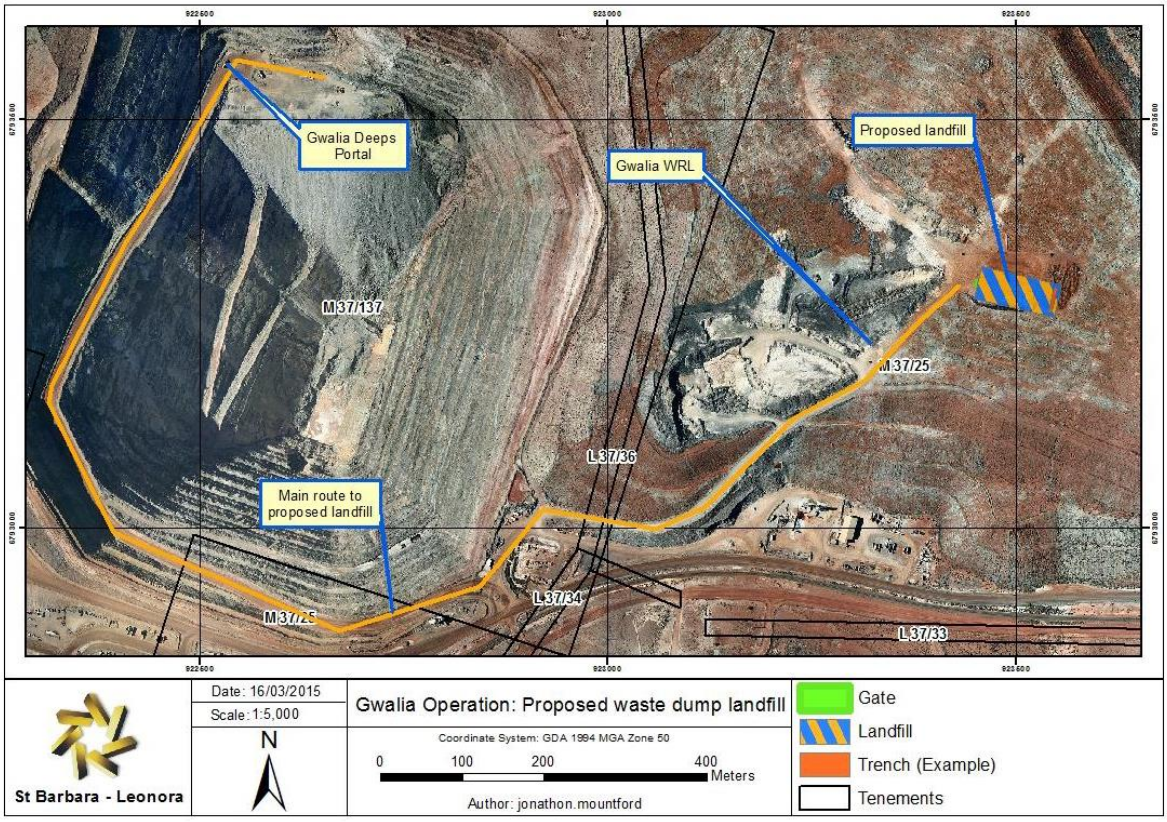

Figure 6: Location of proposed new landfill adjacent to Gwalia Deeps

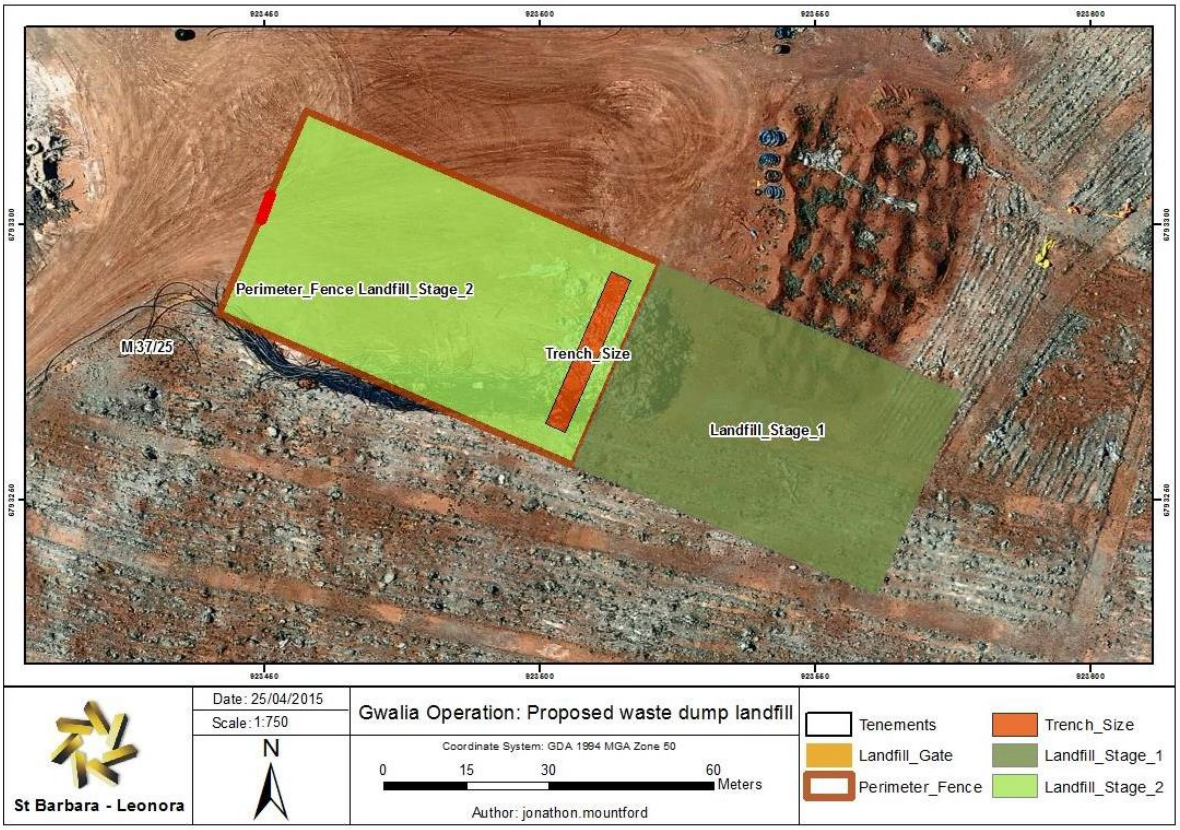

Figure 7: Depiction of the two stages of the landfill, with an indicative trench shown.

Normal Operation

Emission Description
Emission: Uncontrolled release of putrescible waste and other light waste materials, spread via wind, feral animals, vermin.
Impact: Poor amenity and attraction of feral animals and additional vermin to the site
Controls: SBM have proposed to limit the number of open trenches to only one at a time. The Stage 2 facility will be fenced and the use of the Stage 1 facility will be limited as it is intended to dispose of waste currently stockpiled at the site. The use of the landfill will reduce the likelihood that windblown waste will eventuate; a risk currently present with stockpiled materials.

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

Regulatory Controls
Licence condition 1.2.8 has been placed on the Licence to ensure the materials deposited to the landfill are as allowed for a Class II landfill. Condition 1.2.9 specifies the cover material for the trenches in the landfill and frequency that cover must be placed over waste materials. Licence condition 1.2.10 requires windblown waste to be periodically cleaned up. These conditions replace previous licence conditions L1 – L5.

Residual Risk
Consequence: Insignificant
Likelihood: Unlikely
Risk Rating: Low

Reference

Letter from St Barbara Limited to DER dated 8 June 2015.

Appendix B

Premises Operation –Tailings Storage Facility 4 (TSF4)

St Barbara Limited (St Barbara) proposes the construction of a new tailings storage facility, TSF4 over the previously de-commissioned and capped Grant's Patch Tailings Storage Facilities (GPTSFs). The location of the proposed TSF4 is directly south of the existing operational TSF3.

TSF4 will be constructed in six stages of 2.5m each from the approximate current crest level of RL368.5m, to a final crest level of 383.5m. Based on current production levels and in operation with TSF3, TSF4 will provide a total capacity of 5.9 million tonnes and a storage life of 7.4 years.

Tailings will be delivered to the TSF4 sub-aerially and cyclically via multiple discharge spigots positioned around the perimeter. A decant water facility will be established and excess decant will be diverted back to the processing plant (Coffey Mining Pty Ltd 2015).

Normal Operations - TSF Seepage

Emission Description

Emission: Seepage of tailings liquor from TSF4 into surrounding groundwater.
An August 2016 tailings sample indicated a total cyanide concentration of 8.32 mg/L in the tailings liquor. Tailings also contains elevated levels of a range of metals including aluminium (29.4 mg/L), arsenic (0.082 mg/L) and chromium (0.245 mg/L).

Impact: Increase in SWLs of groundwater such that there is a recordable impact to vegetation health, from groundwater inundation in the root zone (waterlogging). Increase in groundwater levels of heavy metals including mercury, nickel and lead.
Groundwater in the immediate vicinity of the project area is typically hypersaline (between 72,000mg/L and 132,000mg/L) and contains trace levels of WADCN (peaking at 0.27mg/L) (Coffey Mining Pty Ltd 2015). Recent 2014 - 2015 groundwater monitoring data in the vicinity of TSF2 and TSF3 did not detect WAD CN above an analytical detection limit of 0.04 mg/L (St Barbara Limited 2015). Groundwater in the project area moves in a south-westerly direction, towards Lake Raeside.

Controls: The TSF4 will be constructed with a downstream seepage recovery system (including a sump, seepage collection trench and a pump). The effectiveness of the seepage recovery system will be audited annually during operation of TSF4 (Coffey Mining Pty Ltd 2015).

The TSF4 will be constructed on top of a capped ex-tailings facility with a base permeability averaging 10^{-8} m/s. The existing tailings within GPTSFs will mitigate the seepage from TSF4. Seepage modelling undertaken using a 3-D MODFLOW model was developed to calculate the expected seepage from TSF4 in the final lift scenario (embankment height at 383.5 m RL and tailings at 383 m RL). This showed that the TSF4 would release 200m^3/day to its foundations and 90m^3/day to the adjacent Lake Raeside, approximately 10% of the expected seepage from the existing TSF3 (Coffey Mining Pty Ltd 2015).

Six monitoring bores will be installed around the TSF4 perimeter to monitor groundwater standing water levels and detect changes in groundwater quality due to seepage.

TSF3 is currently managed through Gwalia's TSF Operations Manual. This document outlines a set of management tasks designed to control the discharges into the TSF through monitoring, contingency actions, record management, training, allocation of management responsibilities and emergency response. The document will be amended to include TSF4 prior to the facility commencing operation.

The Licensee has made a commitment to minimise the decant pond on the TSF at all times (Coffey Mining Pty Ltd 2015). This will ensure that the rate of the seepage is kept as low as possible, in accord with the design specifications.

Risk Assessment
Consequence: Minor, seepage modelling estimates that seepage from TSF4 will be approximately 10% seepage rate of TSF3.
Likelihood: Possible; seepage recovery systems will be constructed however an amount of seepage will not be able to be captured by these.
Risk Rating: Moderate

Regulatory Controls
Licence conditions 1.2.2 to 1.2.5 have been amended to include TSF4 as a tailings containment facility and the ongoing management of TSF4. Seepage recovery systems are included in the approved design for TSF4 and must be maintained, along with existing seepage recovery system for TSF 3 (refer licence condition 1.2.4).

Licence condition 1.2.6 and Table 1.2.3 authorises the incremental construction of TSF4 in multiple stages. At this time, operation of TSF4 is not authorised beyond stage 1, pending receipt of compliance documentation required by conditions

Table 3.3.1 will be amended to include the six monitoring bores around the perimeter of TSF4, following installation of the six monitoring bores and prior to Stage 1 operations of TSF4.

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

Reference

Coffey Mining Pty Ltd (2015) *St Barbara Limited: Gwalia Mine, Works Approval Application Tailings Storage Facility 4*, 24 July 2015.

St Barbara Limited (2015) *Leonora Operations Annual Environmental Report 1 September 2014 – 31 August 2015*

Abnormal Operation – Tailings supernatant pond water quality

Emission Description
Emission: Tailings with high concentrations of weak acid dissociable (WAD) cyanide discharged to TSF4 due to operator error or poor process plant control.
Impact: Avifauna death or poor health from contact with tailings supernatant.
Controls: The Licensee has made a commitment to maintain the WAD cyanide concentration below 50 mg/L, the concentration recommended by the International Cyanide Code for protection of wildlife (Coffey Mining Pty Ltd). The current Tailings Operation Manual for TSF3 will be updated to include TSF4. An August 2016 sample of tailings liquor indicated a WAD CN concentration of 9.17 mg/L.

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

Regulatory Controls
Historical management of TSF3 has seen no reported incidents of elevated WAD cyanide being discharged to the facility. No additional regulatory controls are required.

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

Emergency Operation – Overtopping of TSF4

Emission Description
Emission: Overtopping of tailings liquor or slurry from TSF4 released to land.
Impact: Tailings contamination of land and impact to native vegetation. Potential to impact adjacent Lake Raeside, a salt lake.
Controls: TSF4 is designed to contain a 1 in 100 year ARI (annual recurrence interval) rainfall event over a 72 hour period (178 mm) providing the decant water is continually removed from the facility. The Licensee has also made a commitment that a 0.7 m operational freeboard will be maintained (Coffey Mining Pty Ltd 2015).

Risk Assessment
Consequence: Major, potential to impact on biological function of the adjacent salt lake, Lake Raeside.
Likelihood: Rare, a 300mm freeboard provides storage in excess of the 1 in 100 year ARI, 72 hour event (178mm).
Risk Rating: Moderate

Regulatory Controls
Licence condition 1.2.3 requires that a minimum freeboard of 300mm from the top of the perimeter embankment to the tailings beach is maintained for TSF3 and TSF4. Daily inspections of freeboard are required by condition 1.2.2. These conditions replace previous licence conditions W9(a), W9(b) and W16.

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

Reference

Coffey Mining Pty Ltd (2015) *St Barbara Limited: Gwalia Mine Works Approval Application Tailings Storage Facility 4*, 24 July 2015.

Emergency Operation – Failure of tailings delivery and return pipelines

Emission Description
Emission: Spillage of tailings liquor or solids from failure of tailings delivery pipelines or return water pipelines.
Impact: Potential impact to vegetation, causing death or stress, localised soil contamination.
Controls: The pipeline corridor will be bunded. A leakage detection system via loss of pressure or flow will be installed on the pipelines. Regular inspection of the pipeline will be conducted (Coffey Mining Pty Ltd 2015).

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

Regulatory Controls
Licence condition 1.2.1 requires all tailings and tailings decant pipelines provide either telemetry systems to detect loss of flow, automatic cut outs in the event of loss of flow or secondary containment in order to capture and minimise spills in the event of a pipeline failure.

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

Reference

Coffey Mining Pty Ltd (2015) *St Barbara Limited: Gwalia Mine Works Approval Application Tailings Facility 4*, 24 July 2015.