



Licence Number L8337/2009/2

Licence Holder St Barbara Limited

ACN 009 165 066

File Number: 2012/006861

Premises
Gwalia Gold Mine
LEONORA WA 6438

Legal description –

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, M37/454, M37/849, M37/903, M37/1026, M37/1027, L37/33, L37/34, L37/35, L37/36, L37/56, L37/58 and L37/66

Date of Amendment 18/04/2019

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act), as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Tim Gentle

Manager – Resource Industries

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA).

Definitions and interpretation

Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 33 Cloisters Square PERTH WA 6850 Locked Bag 10 JOONDALUP DC, WA 6919 info@dwer.wa.gov.au
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
Licence Holder	St Barbara Limited
Noise Regs	Environmental Protection (Noise) Regulations 1997
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to an amendment relating to Category 52 – Power generation.

The following guidance statements have informed the decision made on this amendment:

- *Guidance Statement: Regulatory Principles* (July 2015)
- *Guidance Statement: Setting Conditions* (October 2015)
- *Guidance Statement: Decision Making* (February 2017)
- *Guidance Statement: Risk Assessment* (February 2017)

Amendment description

It is proposed that the Gwalia Gold Mine Prescribed Premises License L8337/2009/2 is amended to provide for the expansion of power generation capacity of the Gwalia power station from the currently approved 16MW, to a capacity of 23 MW. This will allow for the installation of four additional QSV91 C2000, 2 MW generators at the power station, which will provide power for additional mine ventilation and cooling capacity.

The proposed addition of the four additional generators to the Gwalia power plant will see an increase in noise and air emissions during operation. Emissions from the construction of the 4 new units will be minimal as the units themselves are already constructed. Possible noise and dust emissions will be limited to the earthworks and laying of the concrete base and the erection of the cladding surrounding the power station. The time frame of construction will be less than 3 months and will consist of the pouring of concrete at the generator bays, the erection and cladding of a 40 m extension of the existing housing structure, and the lifting of the additional generators into place via crane lifts. Once this is undertaken, the generators will be commissioned then connected to the power station. No noticeable emissions are expected from the construction activities.

Noise emissions

It is important to recognise that the noise emissions from the operations at Gwalia Mine are currently exceeding the limits outlined in the Environmental Protection (Noise) Regulations 1997(Noise Regs) by up to 17 dB during the night time at sensitive noise receptors. The Licence Holder has applied for an exemption under reg.17 of the Noise Regs. This application is currently being assessed by DWER's Noise Regulation branch. Noise emissions from the operations at Gwalia are modelled on night time emissions as this is the time that sees the highest rate of exceedance to the Noise Regs.

Modelling undertaken by Lloyd George Acoustics show that the overall noise emissions from the operation of 4 new units will increase by a nominal amount, on average 0.5 to 1.0 dB at various noise sensitive receptors. The location of the proposed power units is shown in Diagram 1 below.












 <p>St Barbara Leonora</p>	Date: 9/12/2018 Scale: 1:519	Gwalia Premises: Power station discharge points Coordinate System: GDA 1994 MGA Zone 51 0 4.75 9.5 19  Meters Author: Daniel Gibbons	<ul style="list-style-type: none">  Powerstation extension  Absorption chiller exhaust (C1750)  Dual fuel engine exhaust  Gas engine exhaust (C1750)  Gas engine exhaust (C2000)  Proposed gas engine exhaust (C2000)
			

Diagram 1: Gwalia Power Station

Modelling data with no additional noise suppression is shown in Diagram 2 below. The modelling shows in the 'overall' column, the night time noise levels currently experienced at each noise sensitive receptor and the predicted noise levels once the 4 new power units are installed.

Receiver	Noise Source						Overall
	Power Station	Process Plant (inc. ROM loader)	Cooling Towers	Vent Fans	Bulk Air	Paste Plant	
Lot 479	43.6 / 43.9	38	34	29	24	23	45 / 45
Lot 481	46.8 / 47.2	42	36	35	23	30	49 / 49
Lot 494	42.9 / 43.3	35	27	31	17	17	44 / 44
Lot 499	42.0 / 42.5	38	30	31	22	24	44 / 44
Lot 541	41.7 / 42.0	39	29	28	25	29	44 / 44
Lot 542	38.8 / 39.5	38	31	25	24	28	42 / 42
Lot 588	46.8 / 47.3	40	33	35	29	27	48 / 49
Lot 856	40.3 / 40.9	36	27	30	23	29	42 / 43
Lot 869	38.1 / 38.5	37	27	33	25	29	42 / 42
Lot 873	37.5 / 37.5	36	26	34	23	30	41 / 41
Lot 913	39.5 / 40.2	35	29	33	25	29	42 / 42
Lot 936	35.6 / 36.5	44	27	32	21	32	45 / 45
Lot 1267	40.1 / 40.1	37	29	33	25	28	43 / 43
Hoover House	46.8 / 47.7	45	37	37	30	35	50 / 50

Diagram 2: current noise levels compared with predicted noise levels (dB LA10)

LA10 assigned noise levels at each sensitive receiver is calculated by considering the influencing factors contained in the Environmental Protection (Noise) regulations 1997. The assigned noise level with relevant influencing factors for each noise sensitive location is shown in Diagram 3 below.

Location	Time of day	LA10 assigned level with influence factor (dB)
Lots 479, 481, 494, 499, 588 and 936	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	37
Lots 541, 542, 856, 873, 913 and 1267		35
Hoover House		44

Diagram 3: assigned noise levels for sensitive receptors, Gwalia mine

To counter the increase in noise levels at sensitive receptors, the Licence Holder proposes installing 4 silencing mufflers onto power unit's #5 to #8. The silencers for the 4 units will be manufactured by Dürr Universal and modelling of the sound levels before and after installation of the mufflers show a marked improvement in sound suppression (Diagram 4 below).

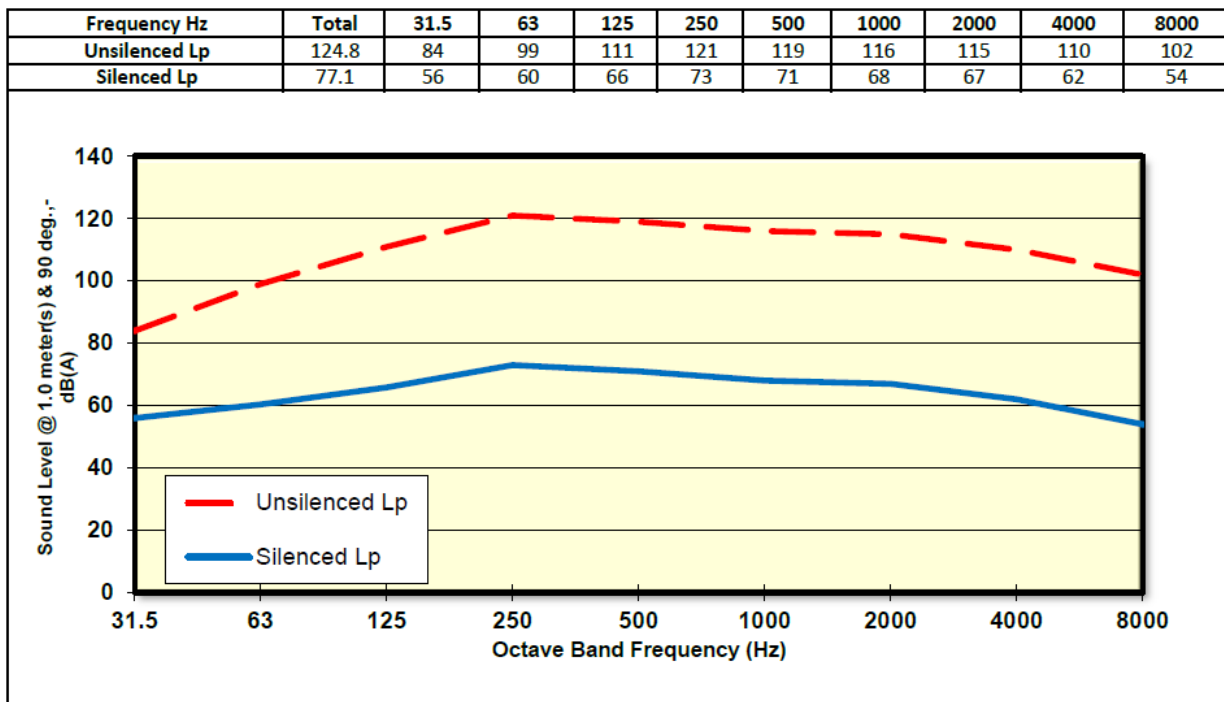


Diagram 4: sound levels with installed mufflers

The installation of the silencing mufflers onto unit's #5 to #8 will see a noticeable decrease to the noise emissions emitting from each unit, up to 48 dB at 250 Hz.

With the addition of the silencing mufflers, modelling in Diagram 5 below shows a predicted overall decrease in night-time noise levels at most receptors. It is noted that even with the four silencing mufflers, the noise levels at every sensitive receptor still exceeds the limits set out in the Noise Regs, as shown in Diagram 3.

Receiver	Noise Source						Overall
	Power Station	Process Plant (inc. ROM loader)	Cooling Towers	Vent Fans	Bulk Air	Paste Plant	
Lot 479	43.6 / 41.1	38	34	29	24	23	45 / 44
Lot 481	46.8 / 43.4	42	36	35	23	30	49 / 47
Lot 494	42.9 / 42.2	35	27	31	17	17	44 / 43
Lot 499	42 / 41.1	38	30	31	22	24	44 / 43
Lot 541	41.7 / 38.5	39	29	28	25	29	44 / 42
Lot 542	38.8 / 36.6	38	31	25	24	28	42 / 41
Lot 588	46.8 / 45.5	40	33	35	29	27	48 / 47
Lot 856	40.3 / 38.1	36	27	30	23	29	42 / 41
Lot 869	38.1 / 37.0	37	27	33	25	29	42 / 41
Lot 873	37.5 / 35.2	36	26	34	23	30	41 / 41
Lot 913	39.5 / 38.1	35	29	33	25	29	42 / 41
Lot 936	35.6 / 34.1	44	27	32	21	32	45 / 45
Lot 1267	40.1 / 38.0	37	29	33	25	28	43 / 42
Hoover House	46.8 / 47.4	45	37	37	30	35	50 / 50

Diagram 5: current and predicted noise levels with noise control (dB LA10)

Air Emissions

The addition of the extra 4 generators will see an increase in emissions to air from the powerhouse stack when operational. Emission modelling for the proposed extension is taken from data sourced from St Barbara's National Environmental Protection Measures (NEPM) data. Diagram 6 below shows the NEPM estimated maximum emissions from the power plant as it currently is operating and with the inclusion of the four new generator units.

NEPM estimation data from current and projected air emissions from the power plant show that there may be potential for NO_x emissions to impact the nearest sensitive receptors.

Licence L8337/2009/2 was amended in July 2018 to include a number of changes including condition 3.4.3. This condition requires the Licence Holder to establish an ambient air monitoring regime at the nearest sensitive receptor to determine the levels of ambient NO_x emissions the receptor is receiving. This monitoring regime is planned to begin in 2019, once an ongoing issue with available power is resolved. St Barbara will be required to ensure that emissions at sensitive receptors are within the standards set out in Schedule 4 of the *Protection of the Environment Operations (Clean Air) Regulation (NSW) 2010*.

	Total current emissions (16MW)	Proposed amendment maximum increase of 7 MW (from 16 to 23)	Estimated maximum total (23MW)
NO _x (kg/year)	164,267	58,333	222,600
CO (kg/year)	403,966	100,155	504,121
VOC (kg/year)	54417.33	23807.58	78224.92
Formaldehyde (kg/year)	23701.33	10369.33	34070.67
PM <10um (kg/year)	1746.67	764.17	2510.83
SO _x (kg/year)	230.67	100.92	331.58
Benzene (kg/year)	210.67	92.17	302.83
Xylene (kg/year)	85.73	37.51	123.24
Vinil Chloride (kg/year)	6.68	2.92	9.60
PAH (kg/year)	0.08	0.03	0.11

Diagram 6: air emission estimations from Gwalia Power plant

Amendment history

Table 2 provides the amendment history for L8337/2009/2.

Table 2: Licence amendments

Instrument	Issued	Amendment
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
L8337/2009/1	09/04/2009	New licence issued – old licence expired
L8337/2009/2	09/02/2014	Licence re-issue
L8337/2009/2	08/12/2016	Licensee amendment to construct and operate new landfill and TSF4 construction
L8337/2009/2	19/07/2018	Licensee initiated amendment notice to increase cat.52 capacity, change the boundary of the landfill onsite, to include a number of tenements to the premises boundary, to modify sampling methodology and to reflect the 'paste fill' plant.
L8337/2009/2	18/04/2019	Licensee initiated amendment to include 4 new generator units at the power plant to a total of 23 MW.

Decision

Licence Holder controls for the increase in category 52: power generation are currently conditioned on the Licence to capture operational emissions relating to point source emissions from the power plant. Conditions 2.1.1 has been updated to include the four new power generator units.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 2 April 2019. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

- The 'Prescribed Premises Category' table is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in bold below:

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)	42 23 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

- Table 2.1.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in bold below:

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
Dual fuel generator (KTA50-G3) exhaust x 8	8.5 m	Exhaust from generator
Gas generators (C1750) x 8	8.5 m	
Gas generator (C2000) x 4 5	10 m	
Elution boiler exhaust	9 m	Gold Elution circuit

3. The Licence is amended by the insertion of the following Condition 1.2.12:

The Licence Holder shall install and maintain onto power generator units number 5, 6, 7 and 8 at the Gwalia Power Plant, 'UltraQuiet Silencer' or equivalent onto each respective exhaust stack.

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L8337/2009/2– Gwalia Gold Mine	L8337/2009/2	accessed at www.dwer.wa.gov.au
2	DER, July 2015. <i>Guidance Statement: Regulatory Principles</i> . Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
3	DER, October 2015. <i>Guidance Statement: Setting Conditions</i> . Department of Environment Regulation, Perth.	DER 2015b	
4	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER 2016b	
5	DER, November 2016. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER 2016c	

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 2 April 2019 for review and comment. The Licence Holder responded on 15 April 2019. The following comments were received on the draft Amendment Notice.

Condition	Summary of Licence Holder comment	DWER response
Page 8: Air Emissions	Licence Holder noted that the monitoring program was delayed due to ongoing issues with power availability at the proposed monitoring site.	Sentence changed to remove "March" 2019.
Page 10: Condition 1	Licence Holder believes the old capacity for category 52 to be "16" and not "12" megawatts.	The current licence has not been changed and still says "10 MW". This amendment notice will reflect the change to 28 MW. New category 52 capacity changed from 28 to 23.