Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 3

Licence Number	L4706/1972/17
Licence Holder	Electrical Generation and Retail Corporation T/A Synergy
Registered business address	Forrest Centre 219 St Georges Terrace PERTH WA 6000
Premises	Muja Power Station Being Lot 5192 on Plan 213624, part Lot 4903 on Plan 167984, Lot 1 on Diagram 53100, and portion of State Forest 24, COLLIE WA 6225
Date of Amendment	11 September 2018

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.

Jonathan Bailes

Acting Senior Manager Process 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
Amendment Notice	refers to this document
ANCOLD	means Australian National Committee on Large Dams Incorporated
AS3580.14	means the Australian Standard AS 3580.14 - Methods for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications;
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* 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	*Environmental Protection Act 1986* (WA)
Licence Holder	Electricity Generation and Retail Corporation T/A Synergy
ML	Megaliter; a million litres
NATA	National Association of Testing Authorities (Australia)
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
USEPA methods	A series of methods approved by the Unites States Environmental Protection Agency for the testing of a substance, such as a pollutant.

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 for Categories 52 and 53. No changes to the aspects of the licence relating to Categories 12 or 61 have been requested by the Licence Holder.

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

On 19 June 2018, the Licence Holder submitted an application to amend Licence L4706/1972/17 for the Muja Power Station. Appendix 1 contains a list of the documents which form the application.

This notice is limited to amendments to Category 52: Electric power generation and Category 53: Flyash disposal. No changes to Category 61: Liquid waste facility or Category 12: Screening, etc. of material have been requested. The Licence Holder has applied to make the following changes:

1. To remove the Muja A (boiler 1 and 2) and Muja B (Boiler 3 and 4) references from the Licence as the four boiler units are no longer operating and are in the process of being decommissioned.
2. To amend air emission sampling methods to reflect the capability of the infrastructure to meet the sampling methodology.
3. To allow for the discharge of iron sludge from groundwater to be discharged into the flyash dam.

Muja A and B power stations each comprise two 60 MW boilers (four in total); closure and decommissioning of these stations will reduce the energy generating capacity of the Premises accordingly. Table 2 below outlines the proposed changes to the licence.

Table 2: Proposed throughput capacity changes

Category	Current production or design capacity	Proposed production or design capacity	Description of proposed amendment
52	1094 MWe per annual period	854 MWe per annual period	The production or design capacity of the Premises is reduced by the decommissioning of four 60 MWe boilers (Muja A and B).

Removal of Muja A and B from the licence

The Licence Holder has retired four of its energy generating boilers at the Muja Power Station and is in the process of decommissioning them. As Muja A and B are no longer operational, the Licence Holder has requested that these authorised emission points and associated monitoring and reporting requirements are removed from the licence.

Allow for discharge of Iron sludge to flyash dam

The Premises has existing approval to dispose of up to 20ML of ferric water treatment sludge from the Muja Power Station Central Water Receival Facility and Desalination Plant (CWRF) into the flyash and bottom ash storage dams. This amendment application requests approval to dispose of an additional 5ML of ferric water treatment sludge generated from the treatment of groundwater to be disposed within the existing flyash dam (a total of 25ML). Of this additional 5ML volume, approximately 97% is water and 3% is sludge. The water will be disposed directly into the fly ash dam or dewatered first and trucked to Cell 2 of the dam for direct deposition as a solid. Once water is removed, it is estimated that up to 1500 tonnes per annum (approximately 1% of total annual deposition by weight) will be disposed of. There is the potential for campaign deposition to occur, where deposition of sludge may occur over a short timeframe.

Amendments to monitoring requirements

Condition 3.2.1 Monitoring of point source emissions to air – the Licence Holder has requested that the specification of USEPA Method 201A for particulate sampling is amended. The sampling port size required for USEPA Method 201A has to be over 150mm in diameter to allow method specific sampling equipment to be used within the stack. The port size used by the Licence Holder is 125mm; therefore, the Licence Holder has requested the use of USEPA Method 5 or 17 as an alternative.

Condition 3.2.3 Monitoring of point source emissions to air – the Licence Holder has requested that the wording of Condition 3.2.3 is amended to be clear that separate NATA accredited organisations can be responsible for the stack sampling and subsequent laboratory analysis of samples.

Condition 3.4.1 Ambient environmental quality monitoring – the Licence Holder has requested the correction of administrative errors that omitted ambient air quality monitoring location MUJ5 (site Muja F) from the monitoring network.

Condition 3.5.1 Meteorological monitoring – the Licence Holder is not able to comply with the requirements of AS3580.14 when undertaking meteorological monitoring due to the height of trees in the nearby state forest which could interfere with monitoring results. Strict compliance with the standard would require significant clearing of vegetation. All other requirements of the standard are able to be met.

Amendment history

Table 4 provides the amendment history for Licence L4706/1972/17.

Table 3: Licence amendments

Instrument	Issued	Amendment
L4706/1972/17	10/10/2014	Licence reissue and conversion to new format template
L4706/1972/17	10/12/2015	Licensee initiated amendment to revise wastewater acceptance requirements and correct administrative errors.
L4706/1972/17	29/04/2016	Amendment by notice to extend the licence duration to 17 October 2036.
L4706/1972/17	06/01/2017	Amendment Notice 1 Update registered business address

Instrument	Issued	Amendment
L4706/1972/17	07/04/2017	Amendment Notice 2 Monitoring conditions updated to reflect installation of CEMS on air emission points A3 and A4, and remove redundant improvement conditions.
L4706/1972/17	11/09/2018	Amendment Notice 3

Location and receptors

Table 5 below lists the relevant sensitive land uses in the vicinity of the premises which may be receptors relevant to the proposed amendment.

Table 4: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Rural farming residential dwellings	4km east 4.2km south east 5.5km south

Table 6 below lists the relevant environmental receptors in the vicinity of the premises which may be receptors relevant to the proposed amendment.

Table 5: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
State Forest	The premises are surrounded to the south and west by State Forest 4 and State Forest 24. There are a number of listings of threatened flora and fauna within these forests.
Threatened fauna Threatened flora	There are five listings of threatened fauna within 500m of the Premises, including one within the Premises boundary. The closest threatened flora listing is within 500m of the flyash dam.
Rivers Other	Collie River East (4.4km from premises) Collie River West (4.8km from premises) There is a minor non-perennial stream/ inundation area perpendicular to the flyash dam as shown in Figure 1. It is not considered a specified ecosystem.

Environmental receptors	Distance from Prescribed Premises
Rights in Water and Irrigation Act 1914 (RIWI Act) Groundwater Area • Collie Groundwater Area	The premises lie within the proclaimed Collie Groundwater Area. Groundwater monitoring at the premises indicates that water quality around the fly ash dam is variable. Groundwater can be found at shallow depths surrounding the flyash dam (between 0.7mbgl and 17mbgl). The water quality is generally acidic and saline where it has been impacted by the prescribed activities and contains a number of metals and metalloid contaminants. However some good quality, 'fresh' groundwater with less than 500mg/L of salt and a pH closer to 7 has been found in some locations around the flyash dam (specifically monitoring bore locations: MB1A, MB12A and MB10A). The beneficial uses of the groundwater include: • Source water for industrial activities, • Use by deep rooted vegetation species during dry periods within the State forest 24 and State forest 4; and • Use as stock water for agricultural properties when freshwater in dams is low. The nearest farms are approximately 3.5km to the east.
RIWI Act Surface Water Area • Collie River Irrigation District	The Premises lies within the proclaimed Collie River Irrigation District. There are no known surface water irrigation uses in the vicinity of the Premises.

Figure 1 below shows the inundation area within State Forest 24, adjacent to the flyash dam.

Risk assessment

Table 7 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. The table identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Figure 1: Non perennial stream/inundation area near Muja Power Station flyash dam.

Table 7: Risk assessment for proposed amendments during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cat 53 *Flyash disposal*	Disposal of up to 5,000kL of ferric containing wastewater/ or 1500 tonnes of ferric sludge into the flyash dam	**Increase seepage**: of contaminants of the flyash dam **Flyash slurry**: Acidic water with elevated metals, fine particle ash and ferric sludge waste	Soil and groundwater	**Land**: direct infiltration through soil profile **Groundwater**: infiltration through soil to groundwater	Groundwater acidification contributing to a decline in water quality. Rising groundwater levels may cause harm to vegetation and a decline in water quality within the inundation area.	Slight	Possible	Low	The Delegated Officer considers there will be no change in the risk of seepage through the base of the liner through the deposition of ferric sludge/ ferric sludge waste water when compared with the same volume of flyash. No further assessment required.
		Overtopping: due to excess loading or heavy rainfall events or both	Soil and groundwater	**Land**: direct infiltration through soil profile **Groundwater**: infiltration through soil to groundwater	Groundwater acidification contributing to a decline in beneficial use. Rise in groundwater levels causing harm to vegetation and a decline in water quality within inundation area adjacent to flyash dam	Slight	Possible	Low	There will be no overall change to the risk of overtopping due to excess loading or heavy rainfall events or both. Existing licence conditions apply: Condition 1.3.2 requires an annual water balance for the fly ash dam be undertaken; Condition 1.3.3 requires the site to operate the dam in accordance with the Muja Power Station Ash Dam Environmental Management Plan. The Delegated Officer has amended Condition 5.2.1 to require the water balance be submitted within the Annual Environmental Report.

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
		Discharge of slurry to the environment through embankment failure **Flyash slurry**: Acidic water with elevated metals, fine particle ash and ferric sludge waste	Native vegetation and the non-perennial stream/ inundation area adjacent to the flyash dam.	Land and water: covering and inundation of nearby land and surface water resource; infiltration to groundwater.	Soil contamination. Loss of terrestrial ecosystem and nearby surface water resource/ inundation area through burial. Degradation of groundwater quality impacting on use by native vegetation.	Major	Rare	Medium	The consequence of embankment failure is considered major due to the potential for high level impacts off site. The likelihood is considered to be rare as the event will not occur except in exceptional circumstances. There is the potential for the ferric sludge and ferric wastewater to create stratification within the deposition mass within the flyash dam. This risk is assessed in the decision section below.

Risk assessment - embankment failure

While the primary mechanism to prevent, control and mitigate impacts to the environment from embankment failure is the structural integrity of the fly ash dam, other factors may affect stability – such as the size and extent of the saturation zone, seepage management practices, and deposition and decant recovery practices. Surface water run-off and flood events that inundate the base of the dam also have the ability to compromise the embankments. In the event of an embankment failure or 'dam break' incident, impacts are likely to be significant with last effects spread over a large geographical area.

The management of deposition practices into the ash dam is critical to embankment stability as deposition directly affects the extent and location of the saturation zone within the ash dam, even when the embankments are designed and constructed in accordance with industry recognised practices (ANCOLD 2003, ANCOLD 2012; DMIRS 2017).

The Licence Holder currently disposes of a mixture of materials into the fly ash dam other than fly ash and bottom ash. These include brine concentrate, reverse osmosis reject material, sludge from the water treatment system and ferric water treatment, and sludge from the Central Water Receival Facility and Desalination Plant. The deposition of an additional 1,500 tonnes of solid material (5ML liquid) into the fly ash dam is not significant in itself but when combined with the other materials, and the campaign style of deposition over short timeframes, has the potential to contribute to embankment destabilisation if not managed appropriately.

Through this amendment the Licence Holder can dispose of a combined 25ML of iron sludge waste water per annum into the flyash dam with a dried iron sludge content of approximately 3% (97% water). The material may be dewatered prior to deposition and contribute up to an additional 1500 tonnes of iron sludge into the fly ash dam generated from groundwater treatment per year. The bulk density of ferric sludge can be expected to be significantly higher than that of flyash (approximately 750kg/m^3) which may affect compaction and settling of materials within the flyash cell. Although the deposition of ferric sludge may be of a small volume, by weight there is the potential for it to comprise up to 12% of total deposition material by weight. In addition, variations in the physical and chemical characteristics between the ferric sludge and the fly ash may also affect cohesion, plasticity, and permeability causing stratification within the deposition mass and create variable lateral movement of seepage and the location of the phreatic surface within each cell.

Decision

The Delegated Officer has made the following administrative changes to the licence:

- The following specifications of the licence have been amended to remove the requirements associated with emissions from Muja A and B (emissions points A1 and A2):
    - Table 2.2.1 Emission points to air;
    - Table 2.2.2 Point source emission targets to air'
    - Table 2.2.3 Management actions (note: Table 2.2.3 has also been amended to specify emission points A3 and A4 which were not included in error;
    - Table 3.2.1 Monitoring of point source emissions to air; and
    - Schedule 2: Map of emission points and containment infrastructure.
- Table 3.2.1 has been amended to change the specified method of PM10 and PM2.5 stack monitoring from USEPA Method 201A to Method 5 or 17. The Licence Holder cannot comply with Method 201A due to the sample port size. The Delegated Officer considers that Method 5 or 17 are suitable alternatives.

- Condition 3.2.2 has been updated to clarify that the non-continuous sampling and analysis required by Condition 3.2.1 can be carried out by separate NATA accredited organisations.
- The following specifications of the licence have been amended to include ambient air quality monitoring location MUJ5 (Muja F) which had been omitted from the licence in error:
    - Table 3.4.1 Monitoring of ambient air quality
    - Table 3.4.2 Ambient air quality targets
    - Table 3.4.3 Management actions
    - Table 3.5.1 Meteorological monitoring
    - Schedule 2: Map of ambient air quality monitoring sites
- Table 3.5.1 has been updated as the Licence Holder cannot meet the location requirements of AS3580.14 due to the presence of large trees. This deviation has been accepted by DWER. The Licence Holder's request to amend Condition 3.5.2 has been refused as the condition relates to the calibration, operation and maintenance of the meteorological monitoring stations to achieve stated data availability requirements and not the location/design specification of the stations.

The Delegated Officer considers that the existing environmental controls that are in place to manage environmental risk associated with the day to day operation of the fly ash dam are adequate. However the overall performance of the fly ash dam has the ability to vary dependent on the scale, nature and timing of ferric wastewater or sludge depositions made into the dam, including the campaign style of deposition that is proposed.

The consequence of embankment failure has been assessed as major. There is the potential for high level impacts and specific consequence criteria for the environment to be exceeded off site, particularly in any areas that would become inundated with fly ash such as the terrestrial ecosystem and minor non-perennial stream/inundation area that lies adjacent to the dam.

As the increase in solid materials contained within the 25ML of wastewater that will be deposited into the fly ash dam is minor (3%) and within the currently authorised deposition volume the likelihood of the consequence is considered rare.

However, considering the above and the fact that the layering of materials within the deposition mass may have a destabilising effect on embankment stability over the long term, Condition 4.1.1 has been added to the licence requiring the Licence Holder to carry out a review and audit of the dam to ensure that the operational controls are appropriate and are adequate to address the overall risk.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 30 August 2018. No comments were received and the Licence Holder waived the full consultation period.

Amendment

1. The Licence is amended by the deletion of the following definitions:

   'USEPA Method 7D' *means the promulgated Test Method 7D – Determination of Nitrogen Oxide Emissions from Stationary Sources (Alkaline-Permanganate/Ion Chromatographic Method);*

   'USEPA Method 7E' *means the promulgated Test Method 7E – Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyser Procedure);*

   'USEPA Method 201A' *means the promulgated Test Method 201A – Determination of PM_{10} and $PM_{2.5}$ Emissions from Stationary Sources (Constant Sampling Rate Procedure);*

2. The Licence is amended by the insertion of the following definitions:

   'Annual Audit Compliance Report' *means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO (guidelines and templates may be available on the Department's website).*

   'Department' *means the department established under section 35 of the Public Sector Management Act 1994 and designated as responsible for the administration of Part V, Division 3 of the EP Act.*

3. The Licence is amended by the deletion of *Schedule 2: Reporting & notification forms.*

4. Table 1.3.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 1.3.1: Containment infrastructure			
Containment point reference and location on Map of emission points and containment infrastructure	***Containment cell or dam number(s)***	***Material***	***Infrastructure requirements***
C1	*Bottom Ash Dam settling pond (BAD)*	*Supernatant from the fly ash and bottom ash dam and blowdown from cooling tower.* *Wastewater from Collie A Power Station comprising cooling tower blowdown and wastewater treatment brine.* *Wastewater from the Muja Power Station Central Water Receival Facility and Desalination Plant comprising brine and reverse osmosis rejects.*	*Compacted in-situ soils*
C2	*Coal Storage Area*	*Coal feedstock*	*Compacted in-situ soils*

Table 1.3.1: Containment infrastructure			
Containment point reference and location on Map of emission points and containment infrastructure	**Containment cell or dam number(s)**	**Material**	**Infrastructure requirements**
C3	*Ash Storage Dam*	*Fly ash and bottom ash, including brine concentrate used in the flash handling process; Reverse Osmosis rejects and sludges from the power station water treatment system, and ferric water treatment sludges from the Muja Power Station Central Water Receival Facility, ~~and~~ Desalination Plant and groundwater supply system.*	*Compacted in-situ soils*
C4	*Supernatant Dam*	*Supernatant and stormwater from the Ash Storage Dam.*	*HDPE and clay lined with leak detection system*

5. Table 1.3.2 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 1.3.2: Waste acceptance		
Waste	**Quantity Limit**	**Process requirements**
Wastewater stream from Collie A power station comprising cooling tower blowdown stream and wastewater treatment brine	*None specified*	*Wastewater from Collie A power station can be received on the Premises as a contingency measure.* *Wastewater to be discharged to the Bottom Ash Dam specified in Table 1.3.1*
Wastewater stream from the Muja Power Station Central Water Receival Facility, ~~and~~ Desalination Plant and groundwater supply system comprising ferric water treatment sludges	*~~20~~ 25 ML per annual period*	*Ferric water treatment sludges to be discharged to the Ash Storage Dam specified in Table 1.3.1*
Wastewater stream from the Muja Power Station Central Water Receival Facility and Desalination Plant comprising brine and reverse osmosis rejects	*None specified*	*Brine and reverse osmosis rejects to be discharged to the Bottom Ash Dam specified in Table 1.3.1*

6. Table 2.2.1 of the Licence is amended by the deletion of the text shown in strikethrough below:

Table 2.2.1: Emission points to air			
Emission point reference and location on Map of emission points and containment infrastructure	***Emission Point and source***	***Emission point height (m)***	***Source, including any abatement***
~~*A1*~~	~~*Stack A*~~	~~*98*~~	~~*Boiler unit 1 and 2 (60 MWe each) for Stage A via bag house*~~
~~*A2*~~	~~*Stack B*~~	~~*98*~~	~~*Boiler unit 3 and 4 (60 MWe each) for Stage B via bag house*~~
A3	*Stack C*	*151*	*Boiler unit 5 and 6 (200 MWe each) for Stage C via ESP*
A4	*Stack D*	*151*	*Boiler unit 7 and 8 (227 MWe each) for Stage D via ESP*

7. Table 2.2.2 of the Licence is amended by the deletion of the text shown in strikethrough below:

Table 2.2.2: Point source emission targets to air			
Emission point Reference	***Parameter***	***Target (including units)[1,2,4]***	***Averaging period[3]***
~~*A1 and A2*~~	~~*PM*~~	~~*80 mg/m^3*~~	~~*CEMS (60 minute average)*~~
A3 and A4	*PM*	*250 mg/m^3*	*CEMS (60 minute average)*
	Oxides of nitrogen	*800 mg/m^3*	*CEMS (60 minute average)*

Note 1: All units are referenced to STP dry
Note 2: All units are referenced to 7% O2
Note 3: CEMS requires clock hour average. Averaging periods must be referenced by the end time of the averaging period with the first averaging period of a calendar day ending at 01:00am.
Note 4: Emission targets are not applicable during start-up and shut-down periods of operation.

8. Table 2.2.3 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 2.2.3: Management actions			
~~Emission point reference~~	***~~Event/ action reference~~***	***~~Event~~***	***~~Management action~~***
~~A1 and A2~~ *A3 and A4*	*EA1*	*USEPA Performance Specification 11 CEMS correlation via manual stack sampling causes exceedance of particulates target.*	*The Licensee shall notify the CEO in writing 7 days prior to commencement of the annual CEMS calibration curve correlation.*
~~A1 and A2~~ *A3 and A4*	*EA2*	*Exceedance of particulates emission target.*	*The Licensee shall complete a review of the operation of the pollution control equipment and CEMS within 48 hours of the event unless the management action specified for event EA1 has been completed.*

9. Table 3.2.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 3.2.1: Monitoring of point source emissions to air					
Emission point reference	**Parameter**	**Units[1, 3]**	**Averaging period**	**Frequency[2]**	**Method**
~~A1-A4~~ A3-A4	Volumetric flow rate	m^3/s	60 minutes	Continuous	CEMS
	Stack temperature	°C			
	PM	mg/m^3	60 minutes	Continuous	CEMS via suitable annual correlation of referenced particulates[4]
	Sulfur dioxide		60 minutes	Continuous	CEMS
A3-A4	NOx	mg/m^3	60 minutes	Continuous	CEMS
~~A1-A2~~	~~NOx~~	mg/m^3	Stack Test (Minimum 30 Minute average~~)~~	~~Annually~~	~~USEPA Method 7D or 7E~~
~~A1-A4~~ A3-A4	Carbon monoxide			Annually	USEPA Method 10
	Total Volatile Organic Compounds		Stack Test (Minimum 30 Minute average)		USEPA Method 18
	Benzene				
	Metals As, Be, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Zn		Stack Test (Minimum 60 Minute average)		USEPA Method 29
	PM_{10}		Stack Test (Minimum 60 Minute average)		USEPA Method ~~201A~~ 5 or 17
	$PM_{2.5}$				

Note 1: All units are referenced to STP dry
Note 2: Monitoring shall be undertaken to reflect normal operating conditions and any limits or conditions on inputs or production.
Note 3: Concentration units are referenced to 7% O_2.
Note 4: Where applicable, USEPA Performance Specification 11 including Appendix F, Procedure 2 will be used to convert and substantiate the calculation of particulate matter from raw instrument data.

10. Condition 3.2.3 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

3.2.3 The Licensee shall ensure that all non-continuous sampling ~~and analysis~~ undertaken pursuant to condition 3.2.1 is undertaken by a holder of NATA accreditation for the relevant methods of sampling ~~and analysis~~. The Licensee shall ensure that all analysis undertaken pursuant to condition 3.2.1 is undertaken by a holder of NATA accreditation for the relevant method of analysis.

11. Table 3.4.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 3.4.1: Monitoring of ambient air quality				
Monitoring point reference and location on Map of ambient emission monitoring sites	***Parameter***	***Units[1]***	***Frequency[2]***	***Method***
MUJ1-MUJ4~~4~~5 (Muja A-D, F) CPS1 (Roche Park)	*Sulfur dioxide*	*ppb*	*Continuous (minimum 5 minute intervals)*	*AS 3580.4.1*
CPS1 (Roche Park)	*PM_{10}*	*µg/m³*		*AS 3580.9.8*
	$PM_{2.5}$			*AS/NZS 3580.9.12*

Note 1: All units are referenced to ambient conditions
Note 2: Intervals must be referenced by the end time of the interval with the first interval of a calendar day ending at 00:05 and the last interval ending at 24:00.

12. Table 3.4.2 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below]:

Table 3.4.2: Ambient Air Quality Targets			
Monitoring point reference and location on Map of ambient emission monitoring sites	***Parameter***	***Target (including units)[1]***	***Averaging period[2]***
MUJ1-MUJ4~~4~~5 (Muja A-D, F) and CPS1 (Roche Park)	*Sulfur dioxide*	*200ppb*	*Continuous (1 hour average)*

Note 1: All units are referenced to ambient conditions.
Note 2: Clock hour average. Averaging periods must be referenced by the end time of the averaging period with the first averaging period of a calendar day ending at 01:00am.

13. Table 3.4.3 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 3.4.3: Management actions			
Monitoring point reference and location on Map of ambient emission monitoring sites	***Event/ action reference***	***Event***	***Management action***
MUJ1-MUJ4~~5~~ *(Muja A-D, F) and* *CPS1* *(Roche Park)*	*EA1*	*The ambient monitoring data indicates an exceedance of ambient sulfur dioxide target specified in Table 3.4.2.*	*The Licensee shall investigate the cause of the exceedance within 2 usual working days of the event and provide a report to the CEO within 5 usual working days of the exceedance. The report shall contain a summary of:* *i. The date, time, location and length of the exceedance;* *ii. Operating conditions of the site for the 48hrs preceding the exceedance, including fuel consumption, load and coal sulphur content;* *iii. Any ambient monitoring data conducted by the Licensee for the 48hrs preceding the exceedance;* *iv. Any meteorological monitoring data conducted by the Licensee for the 48hrs preceding the exceedance;* *v. Any actions that the licensee has taken towards preventing, controlling or abating pollution or environmental harm; and* *vi. Any other factors relevant to the exceedance of the target.*

14. Table 3.5.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 3.5.1: Meteorological monitoring				
Monitoring point reference and location on Map of ambient emission monitoring sites	***Parameter***	***Units***	***Height***	***Method***
MUJ1-MUJ45 *(Muja A-D, F)*	*Wind speed*	*m/s*	*10 m*	*AS 3580.14* *(deviations to be agreed by the Department)*
	Wind direction	*Degrees*	*10 m*	
	Wind direction standard deviation	*Degrees*	*10 m*	
	Air temperature	*°C*	*2m*	
	Relative humidity	*%*	*2m*	
	Solar radiation	*W/m^2*	*Not specified*	
CPS2 *Roche Park*	*Wind speed*	*m/s*	*10 m*	*AS 3580.14* *(deviations to be agreed by the Department)*
	Wind direction	*Degrees*	*10 m*	
	Wind direction standard deviation	*Degrees*	*10 m*	
	Air temperature	*°C*	*2m*	
	Relative humidity	*%*	*2m*	
	Solar radiation	*W/m^2*	*Not specified*	
CPS3 *Collie Motorplex*	*Wind speed*	*m/s*	*30m*	
	Gust speed	*m/s*		
	Wind direction	*Degrees*		
	Wind direction standard deviation	*Degrees*		
	Air temperature	*^{0}C*		
	Relative humidity	*%*		

15. The Licence is amended by the insertion of the following Condition 4.1.1:

4.1.1 The Licence Holder must provide to the CEO by 1 September 2019 an audit of the Ash Storage Dam. The audit must be carried out by a suitably qualified engineer or geotechnical specialist in accordance with the Department of Mines, Industry Regulation and Safety (June 2017), Tailings dam audit – guide.

16. Table 5.2.1 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in underline below:

Table 5.2.1: 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*
1.3.2	*Annual water balance for the Ash Storage Dam*	*None specified*
1.3.4	*Volume of wastewater (kL) accepted onto the premises from external sources during the reporting period. Summarised in a monthly tabular format for each external source.*	*Table*
Table 2.2.2	*Summary of point source emission to air target exceedances*	*None specified*
Table 3.2.1	*Results of point source emission to air monitoring (stack tests)*	
Table 3.2.1	*Point source emission to air CEMS monitoring raw data*	*As condition 5.2.3*
-	*Quantity of flash and bottom ash removed from the Premises summarised in a tabular format for each calendar month*	*Table*
Table 3.3.1	*Weekly summary of stormwater discharge volumes and monitoring results*	
Table 3.4.1	*Monthly summary of ambient SO_2, PM_{10} and $PM_{2.5}$ monitoring results including the daily maximum 24 hour, 60 minute and 5 minute averages.*	*None specified*
Table 3.4.2	*Summary of ambient air quality SO_2 target exceedances*	
Table 3.4.4	*Ambient groundwater quality monitoring results*	
5.1.3	*Compliance*	*Annual Audit Compliance Report (AACR)*
5.1.4	*Complaints summary*	*None specified*

~~*Note 1: Forms are in Schedule 2*~~

17. The *Map of emission points and containment infrastructure* in Schedule 1 of the Licence is updated with the map shown below:

18. The *Map of ambient air quality monitoring sites* in Schedule 1 of the Licence is updated with the map shown below:

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L4706/1972/17: Including Amendment Notice 1 and Amendment Notice 2	L4432/1989/14	accessed at www.dwer.wa.gov.au
2	Licence Amendment Application form and supporting documentation	None	DWER record A1694025
3	Further information	None	DWER records A1704345 and A1704347
4	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
5	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
6	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2016b	
7	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2016c	
8	Department of Mines, Industry Regulation and Safety (June 2017): *Tailings storage facility audit – guide.*	DMIRS 2017	www.dmp.wa.gov.au
9	ANCOLD (2003) *Guidelines on Dam Safety Management*	ANCOLD 2003	www.ancold.org.au
10	ANCOLD (2012) *Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure*	ANCOLD 2012	