Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 2

Licence Number	L4680/1988/13
Licence Holder	FMR Investments Pty Ltd
ACN	009 411 349
File Number:	2013/003899
Premises	Greenfields Processing Site Part mining tenement M15/154 and Lot 102 on Plan 40393 Great Eastern Highway COOLGARDIE WA 6429
Date of Amendment	18/09/2019

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
Digitally signed by Tim Gentle
Date: 2019.09.18 10:58:51 +08'00'

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
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Amendment Notice	refers to this document
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 10 JOONDALUP DC WA 6919 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)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
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	FMR Investments Pty Ltd
m^3	cubic metres
mtpa	million tonnes per annum
NEPM	National Environmental Protection Measure

Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
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.
Risk Event	as described in *Guidance Statement: Risk Assessment*
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)

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 Category 5. No other changes to the aspects of the original Licence 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: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Background

FMR Investments Pty Ltd (the Licence Holder) operate a toll gold ore processing mill and associated Tailings Storage Facility about 3km north east of Coolgardie. The Tailings Storage Facility (TSF) is an above ground facility, comprising two decommissioned cells (TSF1 and TSF2) and three cells A, B and C, which collectively make up TSF3. The cells of TSF3 surround TSF1 and TSF2 to the south and east (refer to Figure 1).

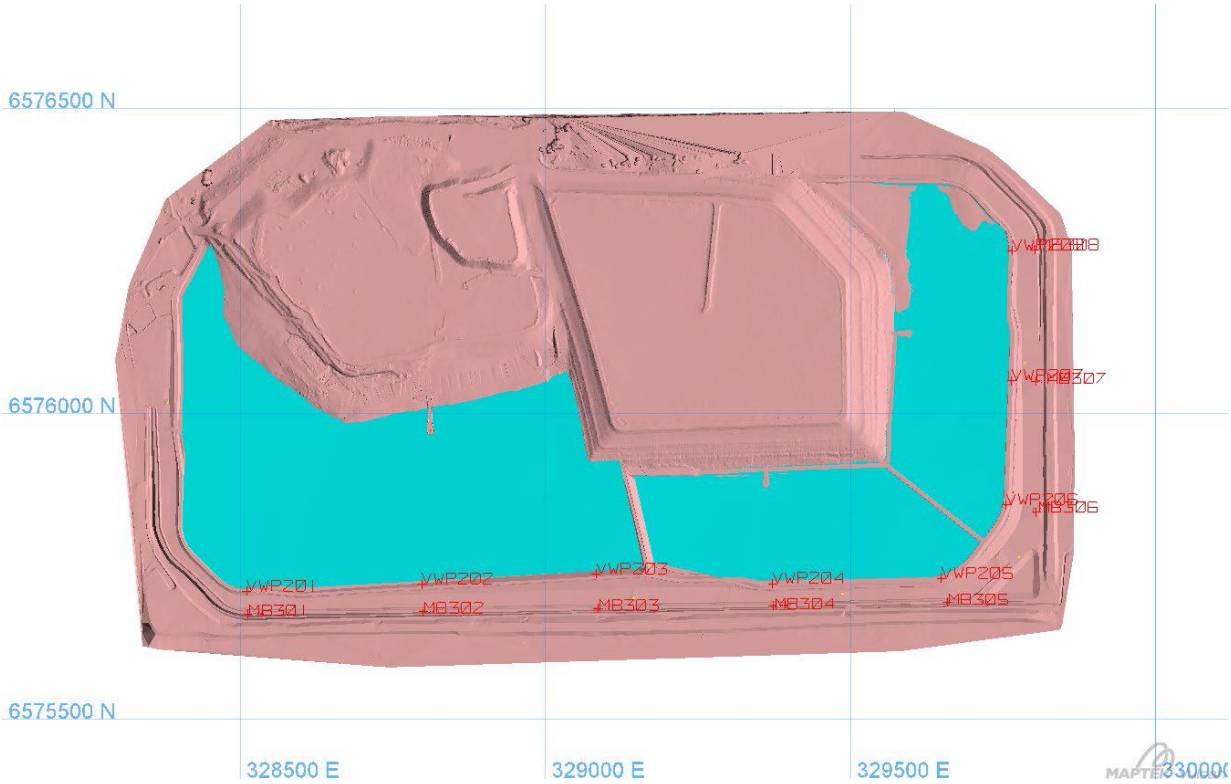

Figure 1: TSF3 cells (blue) with piezometers and monitoring bores

Amendment description

The Licence Holder submitted a request to amend Licence L4680/1988/13 to enable a lift in height of up to 2.5m of the embankment walls of cells B and C within TSF 3. The reason for the lift is to provide ongoing capacity to safely store tailings slurry produced from the milling operation. The amendment relates to Category 5 Prescribed Premises, although no changes to design capacity, processes, or the premises footprint are proposed.

The lifts will be undertaken in two stages, stage 4 and stage 5, both raising the embankments by 2.5 m for each stage. The lifts will see the embankments raised to a final height of RL 400m. The decant accessway, decant link road and associated infrastructure on cells B and C will also be included in the amendment.

The lift is expected to provide up to eight years' of tailings storage capacity. No land clearing is required as the lift will take place on the existing disturbed land within the embankments.

Other approvals

The Licence Holder has advised that the Premises is on freehold land (Lot 102 on Plan 40393 and that as a consequence no other approvals are required. This includes no requirement for a mining proposal to authorise construction, operation or closure of the TSF under the *Mining Act 1978*.

On 29 May 2019, the Department of Mines, Industry Regulation and Safety (DMIRS) issued the Licence Holder with a Prohibition Notice (issued under section 31AE of the *Mines Safety and Inspection Act 1994*) to cease any deposition of tailings into cell A of TSF3 and minimise the water ponding close to the separation embankment between cells A and B of TSF3. This notice was issued due to DMIRS inspectors concern about the stability of the inner embankment wall separating cells A and B.

DWER requested advice from DMIRS with regard to the geotechnical aspects of the proposed TSF3 embankment raises and the implications of the amendment in regards to the stability of the inner embankment wall separating cells A and B. DMIRS provided comments on the proposed amendment on 27 August 2019. The comments stated that the proposal was adequate in meeting the requirements to allow for the Prohibition Notice to be removed from TSF3 once construction of the first of the two proposed lifts has been completed.

DMIRS recommended a number of conditions to be included into the licence to ensure the construction and operation of the TSF3 is undertaken to a specified engineering standard. The following conditions were recommended by DMIRS on 5 April 2019:

- The construction of any tailings storage embankment shall be supervised by an engineering or geotechnical specialist.
- The construction details of any tailings storage embankment shall be documented by an engineering or geotechnical specialist and confirm that the construction satisfies the design intent. The construction document shall include the records of all construction quality control testing, the basis of any method specification adopted, and any significant modifications to the original design together with the reasons why the modifications were necessary. The construction document shall also present as-built drawings for the embankment earthworks and pipework. A copy of the construction document shall be submitted to DMIRS for its records.
- The tailings storage facility shall be checked on a routine daily basis by site personnel during periods of deposition to ensure that the facility is functioning as per the design intent.
- An engineering or geotechnical specialist shall audit and review the active tailings storage facility on an annual basis. The specialist shall review past performance, validate the design, examine tailings management, and review the results of monitoring. Any

deficiencies noted in the audit and review report shall be suitably addressed and improved. The audit and review report shall be submitted to DMIRS and should be accompanied by a recent survey pick-up of the facility and an updated tailings storage data sheet.

- At the time of decommissioning of the tailings storage facility and prior to rehabilitation, a further review report by a geotechnical or engineering specialist shall be submitted to DMIRS. This report should review the status of the structure and its contained tailings, examine and address the implications of the physical and chemical characteristics of the materials, and present and review the results of all monitoring. The rehabilitation stabilisation works proposed and any on-going remedial requirements should also be addressed.
- Maintain a minimum freeboard as per specifications of the design requirements.

All of these conditions were included in the Licence through the previous licence amendment of 8/12/2017.

Amendment history

Table 2 provides the amendment history for L4698/1988/13.

Table 2: Licence amendments

Instrument	Issued	Amendment
L4680/1988/13	8/12/2017	Amendment Notice 1: Raise of TSF 3 Cells A, B and C by 2.5m
L4680/1988/13	19/09/2019	Amendment Notice 2: Raise of TSF3 cells B and C to a height of RL 400m

Location and receptors

Table 3 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 3: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Town of Coolgardie	3km south west of the premises
Pastoral activities	The freehold land on which the TSF is situated is surrounded by pastoral leases and used for stock grazing

Table 4 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 4: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Brown Lake (salt lake)	6km to the east
Ramsar Sites in Western Australia	None within 50km
Important wetlands – Western Australia	None within 50km
Department of Biodiversity, Conservation and Attraction managed land	Kurawang Natujre Reserve 16km north east Karaminde Forest 18km south east Kangaroo Hills Timber Reserve 6km south west

Threatened Ecological Communities and Priority Ecological Communities	None within 50km
Threatened/Priority Flora	No records on the premises. The nearest recorded threatened or priority flora is south of the town of Coolgardie.

Groundwater and water usages

The existing Licence sets a limit for WAD CN in all groundwater monitoring bores of 0.5mg/L and a maximum water level of 4 metres below ground level (mgbl) to minimise any potential impacts to localised groundwater-dependent flora.

The Licence Holder has reported being compliant with these requirements since monitoring began in 2013, with the highest recorded WAD CN being 0.08mg/L and highest groundwater level being 5.2 mgbl. However, a trend of decreasing depth to the water table has been observed at most bores since late 2015, with this reaching the level of 5.2 mgbl in Jun 2018 as shown in Figure 2. The trend is particularly evident in the bores on the southern side of the TSF (MB302, MB303, MB304 and MB305). Rising groundwater has the potential to inundate the root zones of nearby vegetation. With the salinity of the groundwater being over 10,000 mg/L TDS, this would possibly cause vegetation deaths that intercept rising groundwater.

Monitoring surrounding the TSF shows a large variance of TDS in some bores. While most of the bores show TDS levels around the 10,000 to 20,000 mg/L mark, MB303 and MB307 show elevated TDS levels (figure 3 below). The TDS levels of bore MB303 has shown a fairly constant increase since September 2015 and is now up over 90,000 mg/L. Bore MB307 has been consistently around 50,000 mg/L since recording began in 2013. The difference in TDS between these two bores and the remaining bores, may suggest the TSF is leaking outside of expected levels.

Condition 2.3.1 of the Licence contains a limit of 4 mbgl for groundwater within monitoring bores MB301 to MB308.

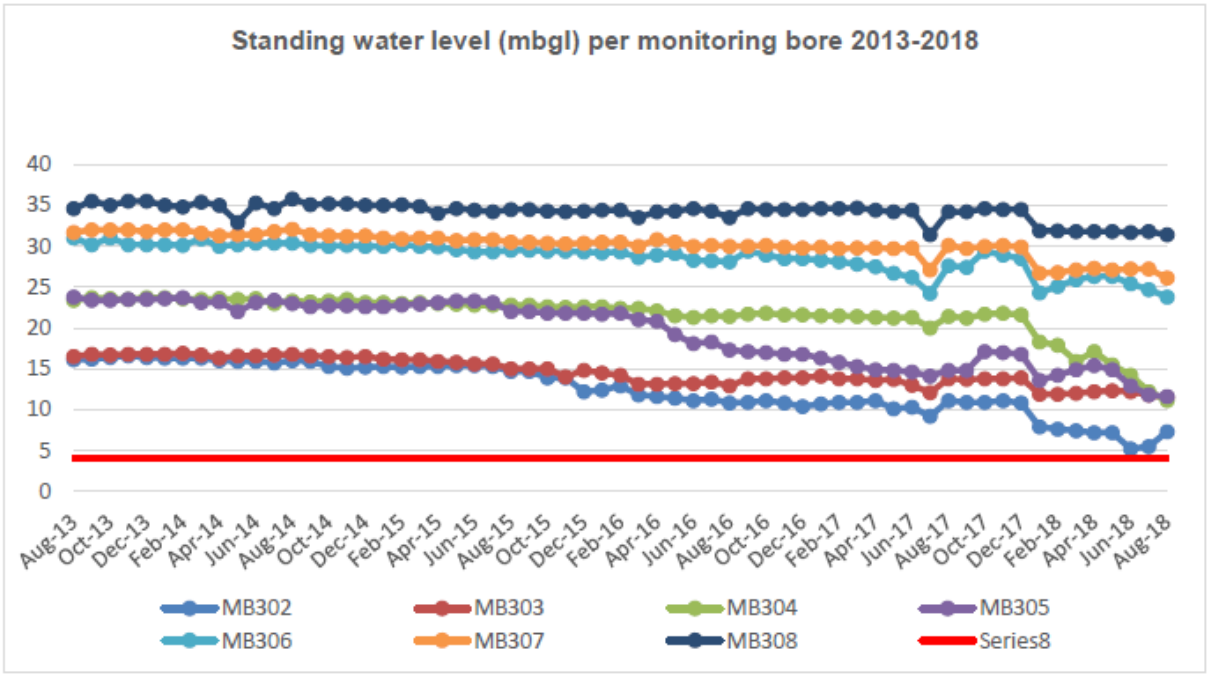

Figure 2: Standing water level (mbgl) of each monitoring bore from 2013 – 2018

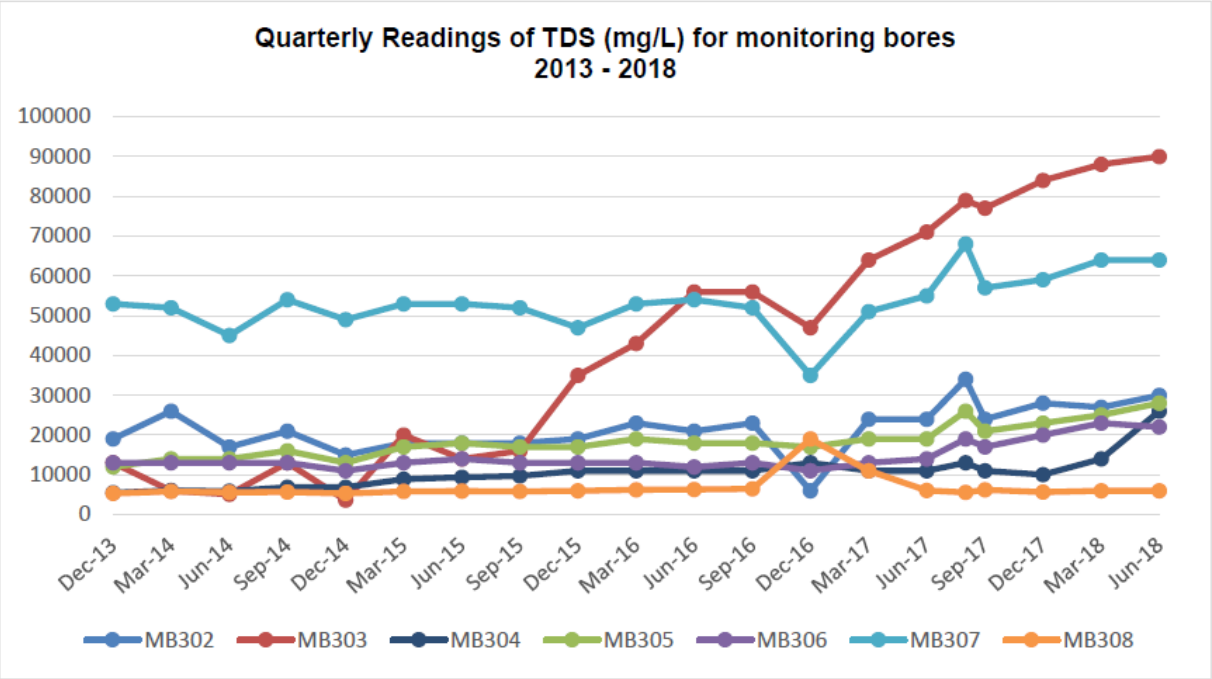

Figure3: TDS (mg/L) of each monitoring bore from 2013 – 2018

The distances to groundwater and water sources and usages are shown in Table 5.

Table 2: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Public drinking water source areas	The nearest is about 50km to the north	Nil
Major watercourses/waterbodies	Brown Lake, 6km to the east	Salt lakes are of ecological value as habitat for algae and invertebrates such as brine shrimp, They may also provide habitat for water birds which feed on the algae and invertebrates.
Groundwater	Localised groundwater near the TSF reports a fluctuating level of TDS between 5,700 mg/L and 90,000 mg/L TDS.	None as specified in DWERs *Guidance Statement Environmental Siting.* Water is not used for potable uses and there are no groundwater bores registered within 2.5 km of the TSF.

Risk assessment

Tables 6 and 7 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 6: Risk assessment for proposed amendments during construction

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cat 5 Processing or beneficiation of metallic or non-metallic ore	Construction of embankment raise	Dust	Town of Coolgardie	Air	Health and amenity	Slight	Possible	Low	The separation distance to the nearest sensitive receptor (Coolgardie – 3km) means that potential noise and dust emissions from the construction of the embankment raise can be adequately managed under general provisions of the EP Regulations and EP Noise Regulations.
		Noise							

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 5 Processing or beneficiation of metallic or non-metallic ore	Deposition of tailings to TSF 3 (cells B and C)	Tailings seepage	Native vegetation	Seepage through groundwater or embankment walls	Adverse impacts on health and survival	Moderate	Possible	Medium	Native vegetation may be impacted by groundwater mounding in the vicinity of the TSF, however groundwater levels remain well below the licence limit 4mgbl (Botanica Consulting 2017). The TSF3 has a seepage underdrainage system installed with drainage directed to external toe drains, graded to the return water dam located in the south east corner external to the TSF 3.

		Tailings liquor	Birds and other native fauna	Direct ingestion of WAD CN and metals (Copper)	Fauna sickness or death	N/A	N/A	N/A	Tailings supernatant liquor quality is hypersaline (~ 110 000mg/L) and has residual WAD CN concentrations of approximately 23mg/L (Botanica 2017). Providing the TDS is kept > 50 000 mg/L, wildlife will not drink the saline water (Adams, M.D., et al 2008. On that basis there is no risk of impacts to birds or other fauna

Decision

Conditions currently on the Licence capture operational emissions relating to construction of the TSF lift. Conditions 1.3.2, 1.3.3 and 3.3.1 have been updated to include specific details related to the Stage 4 and Stage 5 lifts at TSF3.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 17/09/2019. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Amendment

1. 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 bold below:

Table 1.3.2: Inspection of infrastructure		
Scope of inspection	**Type of inspection**	**Frequency of inspection**
Tailings pipelines	Visual integrity	Twice daily
Return water lines	Visual integrity	Twice daily
Embankment freeboard	Visual to confirm required freeboard **of 300 mm** ~~capacity~~ is available	Daily
Embankment integrity	Visual inspection for signs of erosion, embankment cracking, damp or wet areas on batter slopes or toe areas.	Daily
TSF stormwater diversion channels	Visual integrity	Daily

2. Table 1.3.3 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the red text shown in bold below:

Table 1.3.3: Construction of TSF Embankment Raises	
Column 1	**Column 2**
Infrastructure	**Requirements**
Perimeter tailings pipeline	Removal and reinstatement
Upstream perimeter embankment raise of TSF3 Cell A	To a maximum height of RL 399.6m. Construction to be supervised by an engineering or geotechnical specialist.
Upstream perimeter embankment raise of TSF3 Cell B and C	To a maximum height of RL ~~392.6m~~ **400m.** Construction to be supervised by an engineering or geotechnical specialist.
Decant towers and causeways for TSF Cell A, B and C	Relocate the decant towers and causeways to the internal embankment of each cell. Decant A raised to RL 399.7m, and Decant B and C to ~~392.6m~~ **400m**.
Vibrating Wire Piezometers (VWPs)	Install a deep and shallow VWP (VWP201 – VWP 208) at the eight locations in the TSF 3 embankment as shown in Figure 2 of this Amendment Notice 1.
Areas subject to construction activities for TSF Cell A and Cell B/C Raise	Minimise dust by using water carts to wet down work areas

3. Table 3.3.1 of the Licence is amended by the insertion of the red text shown in bold below:

Table 3.3.1: Notification requirements			
Condition or table (if relevant)	**Parameter**	**Notification requirement[1]**	**Format or form[2]**
2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
-	Notification of care and maintenance status	Within seven days of the decision to enter care and maintenance status	None specified
-	Intention to resume normal operations from care and maintenance status	At least 30 days before operations recommence.	None specified
Table 1.3.2	**Any evidence of potential for the structural integrity of the tailings storage facility to be compromised such as:** • **Erosion or cracking of embankment or internal wall; or** • **Damp or wet areas on batter slopes or toe areas.**	**Within 24 hours of identification of any potential for the structural integrity of the tailings storage facility to be compromised.** **Notify both DWER and DMIRS Safety Directorate.**	**None specified**

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L4680/1988/13 – Greenfields Processing Site	L4690/1988/13	accessed at www.dwer.wa.gov.au
2	CMW Geosciences (2019) Tailings Storage Facility No.3 Cells B and C Stages 4 & 5 Upstream Embankment Raising, Greenfields Mill, Design Report	CMW Geosciences 2019	DWER records (A18000976)
3	Application Form: Amendment	24/06/2019	DWER records (DWERDT192879)
4	Adams MD, Donato DB, Schulz RS and Smith GB, 2008, *Influence of Hypersaline Tailings on Wildlife Cyanide Toxicosis*, MERIWA Project M398(II) 'Cyanide Ecotoxicity at Hypersaline Gold Operations'	Adams et al, 2008	https://mriwa.wa.gov.au/publications/previous-project-reports
5	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
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	

Appendix 2: Summary of Licence Holder comments

The Licence Holder was provided with the draft Amendment Notice on 17/09/2019 for review and comment. The Licence Holder responded on 17/09/2019, waiving the remaining comment period.

Condition	Summary of Licence Holder comment	DWER response