Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L4680/1988/13
Licence Holder	FMR Investments Pty Ltd
ACN	009 411 349
File Number	2013/003899-1
Premises	Greenfields Processing Site Part mining tenement M15/1836 and Lot 102 on Plan 40393 Great Eastern Highway COOLGARDIE WA 6429
Date of Report	9 August 2022
Decision	Revised licence granted

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A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L4680/1988/13 is held by FMR Investments Pty Ltd (Licence Holder) for the Greenfields Processing Site (the Premises), located at Lot 102 on Plan 40393, Great Eastern Highway, Coolgardie.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of infrastructure at the Premises. As a result of this assessment, Revised Licence L4680/1988/13 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 2 November 2021, the Licence Holder submitted an application to the department to amend Licence L4680/1988/13 under sections 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Construction and operation of upstream embankment lift at Cell A of Tailings Storage Facility (TSF) 3 from RL402.5m to RL405.0m (Stage 4)

TSF3 is an above ground facility comprising of three adjacent cells namely Cell A, Cell B and Cell C. This tailing storage facility is located in Freehold Land Lot 102 on Plan 40393 (vacant Crown Land). The Licence Holder proposes to raise the perimeter containment embankments of TSF3 Cell A and the cell dividing embankment between TSF3 Cell A and Cell B to provide ongoing tailings storage capacity. The decant accessway, decant structures and associated infrastructure on Cell A will also be raised as part of the proposed works.

The premises is authorised for Category 5 (processing or beneficiation of ore) activities. This project includes works related to changes to the TSF 3 (Cell A) associated with Category 5 but there will be no change to the assessed design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in the licence L4680/1988/13. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020b) are also outlined in the licence L4680/1988/13.

2.2.1 Construction Phase

TSF lift design and stability

The TSF 3 is located on freehold land (Lot 102 on Plan 40393). As such, the *Mining Act 1978* (Mining Act) does not apply, and a Mining Proposal is not required to authorise construction, operation, or closure of the TSF. The *Mines Safety and Inspection Act 1994* and related Regulations do apply.

Based on the ANCOLD (2012) guidelines, the consequence category for TSF3 has been assessed as 'Significant'. The Hazard rating under Department of Mines, Industry Regulation and Safety (DMIRS) Code of Practice is Category 1 – High.

Construction works of TSF3 Cell A (Stage 4) embankment raise

The premises currently operates TSF3, a paddock-style tailings storage facility, which comprises

three cells (A, B and C) with tailings deposition sequenced into each cell until they become full. The crest of the TSF3 Cell A is currently at RL402.5 m. The Licence Holder proposes to raise embankments of Cell A to RL405.0 m applying the upstream construction method, where the new embankment will be formed on the existing Stage 3 crest of TSF3 Cell A, and partly on the adjacent dried tailings beach. Figure 1 shows a cross section drawing of the embankment raise of the Cell A (including Stage 4).

The mill will continue to operate, and tailings will continue to be discharged into either of the adjacent cells (Cell B or Cell C) as required during the construction phase of the embankment raise of the TSF3 Cell A.

The works required to complete the embankment raise are summarised below:

- Excavate dried tailings and clayey borrow materials;
- Place and compact moisture conditioned dried tailings/mine waste/ clayey borrow to form the embankments;
- Undertake QA/QC testing as required;
- Place compacted dried tailings to the decant accessway;
- Place compacted road base on embankment crests and decant accessways; and
- Place decant pipes and filter rock around decant towers.

The cell capacities have been estimated based on parameters including minimum embankment freeboard of 0.3 m, and tailings production of 1,000,000 tonnes per annum (dry), dry density 1.4 t/m^3, and 1% overall beach slope. Based on those parameters the proposed embankment raise from RL402.5 m to RL405.0 m (Cell A) will provide approximately 10 months of storage capacity, which equates to approximately 637,700 m^3. A summary of key dimensions are shown in Table 1 below.

Table 1: Summary of key dimension in TSF3

Properties	Cell A	Cell B	Cell C
Maximum embankment heights, Stage 4/6	9 – 13 m	11.5 – 16 m	9.5 – 17.5 m
Upstream, slope angle	1V:2H		
Overall downstream, slope angle	1V:3H		
Embankment crest width	8 m		
Footprint area, Stage 4/6	23.3 ha	7.6 ha	9.0 ha
Tailings storage capacities, Stage 4/6	815,500 t	266,000 t	315,000 t
Embankment crest levels, Stage 4/6	RL405 m	RL402.5 m	RL402.5 m
Embankment crest levels, Final	RL413.0 m		

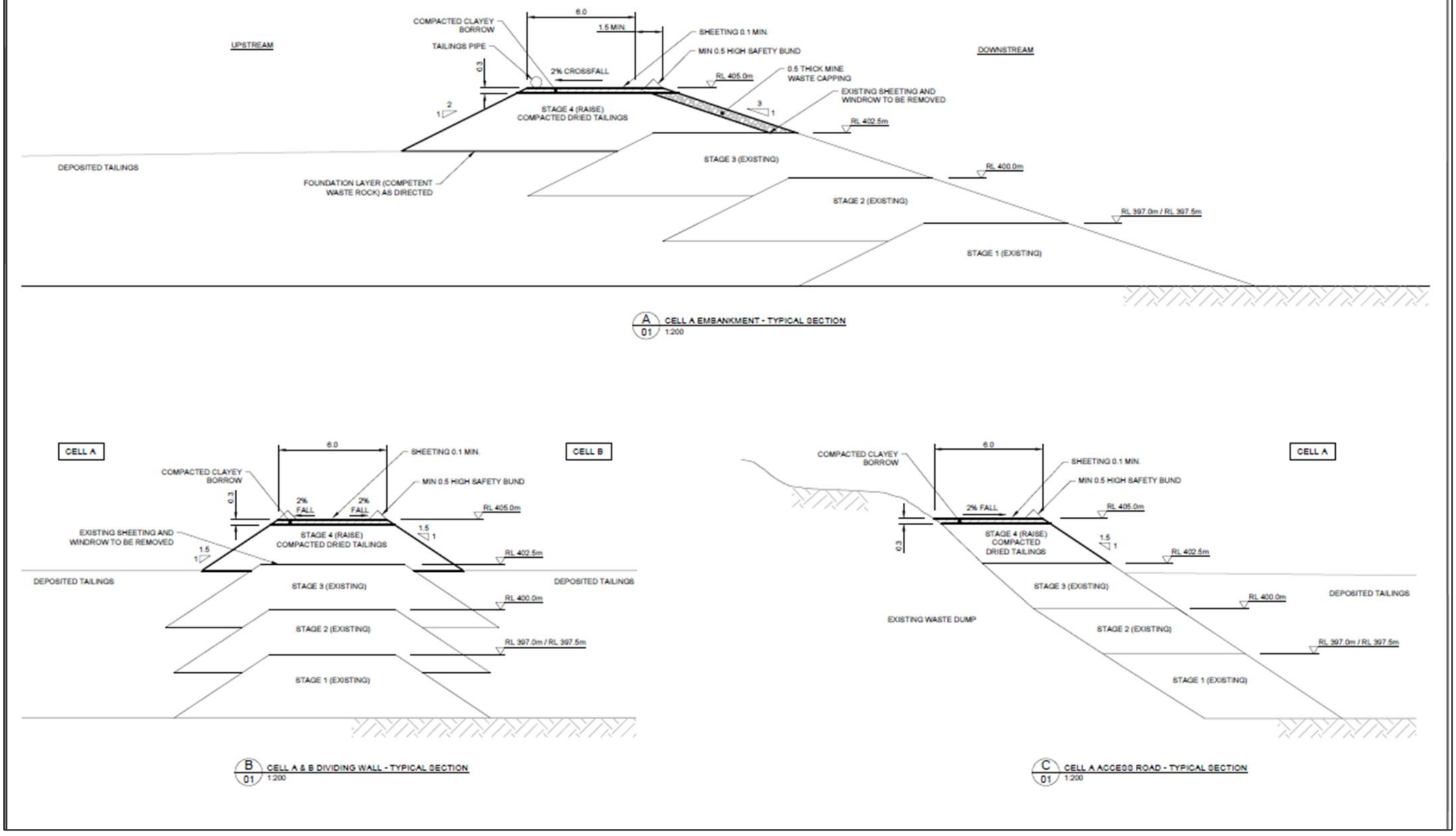

Figure 1: Design of TSF3 Cell A and Cell A/B Diving Wall Embankment Raise to RL405.0 m

The decant accessway, decant link road and decant structures will also be raised along with the perimeter embankments. Access to the decant infrastructure will be provided via a link road running along the side of TSF1 and TSF2. Diversion channels to divert runoff from the TSF3 have been constructed on the southern and eastern side of the facility. These channels are bunded and are 2.0 m wide.

An array of three monitoring bores (MB301, MB302 and MB303) are already in place to monitor any seepage from TSF3 Cell A and additional two monitoring bores (MB309 and MB310) located approximately 300 m directly to the south of the TSF3 Cell A. Three pairs of shallow and deep vibrating wire piezometers (VWP201, VWP202 and VWP203), were already installed to monitor any seepage via embankments. It is proposed that new vibrating wire piezometers (VWPs) will be installed progressively every three embankment raises after Stage 2 (RL400.0 m). Based on this proposal, additional vibrating wire piezometers will be installed during the next embankment raise (Stage 5). Figure 2 shows the location of existing VWPs, seepage recovery bores and monitoring bores around TSF3.

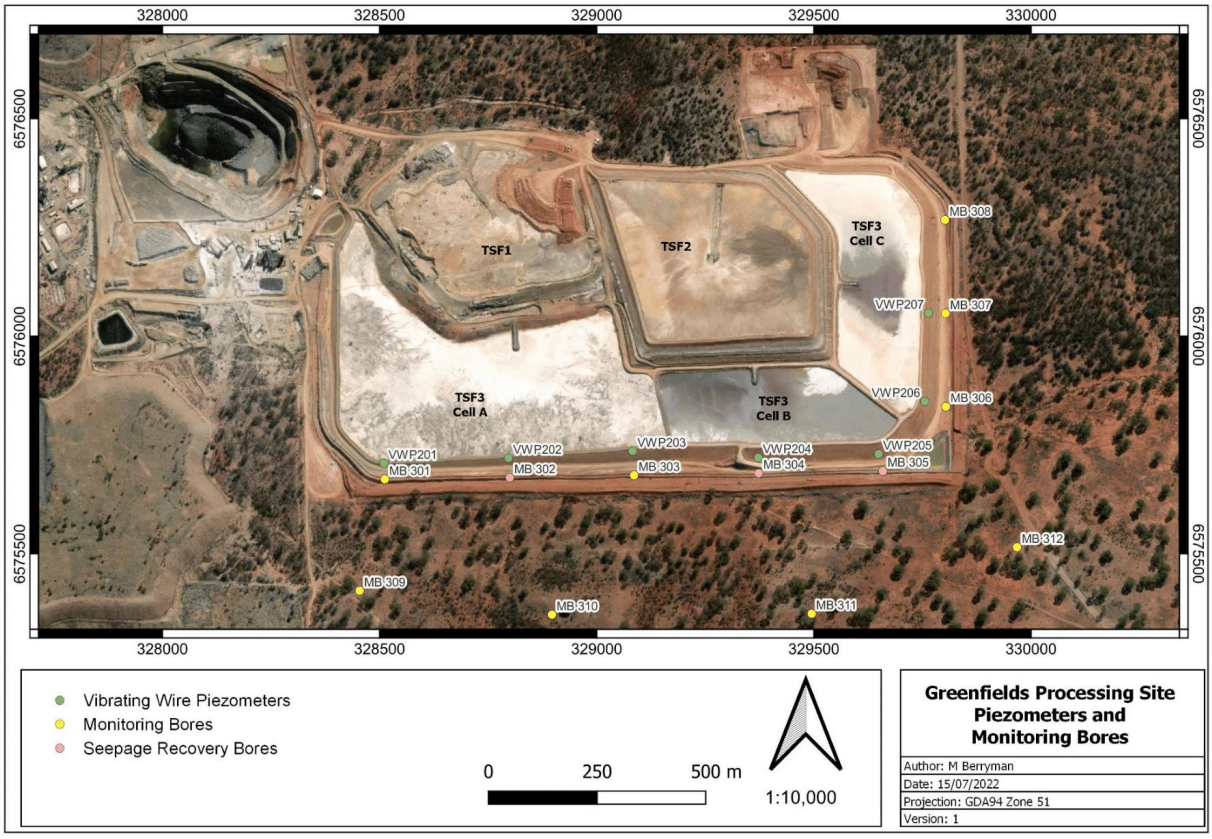

Figure 2: Location of vibrating wire piezometers, seepage recovery bores and monitoring bores

2.2.2 Operation Phase

The Licence Holder proposes that the tailings will be transported via HDPE pipelines and will be discharged sub-aerially via multiple spigots from around the perimeter embankment of Cell A. Spigot offtakes to be located at 20 m intervals. It is proposed that the discharge will occur from a group of spigots at any given time for a period of up to several days. Sequential deposition will take place from the perimeter of the cells in thin layers by alternating the active deposition points. Each layer will not exceed 0.3 m in thickness, in order to allow optimum density and strength gain by subjecting each layer to a drying cycle.

Tailings discharge will be carried out to maintain the supernatant water pond around the water recovery points (decant towers) and will be at least 60 m away from the perimeter embankments at all times. Recovered water will be pumped back to the process plant via a decant pump located in a decant tower. The minimum operational freeboard for the TSF under normal operating conditions will be 0.5 m. In addition, an allowance for the temporary storage of the 1:100 years average exceedance probability (AEP) 72-hour storm event will also be maintained.

The design of TSF3 consists of upstream underdrainage as well as a downstream toe drain that collects potential seepage. Seepage water collected by the underdrainage system flows under gravity to downstream sumps. Water is then pumped to a lined dam for re-use at the process plant or for construction work etc.

Inspections and monitoring

Routine inspections will be carried out for the various components of the system at various frequencies including daily inspections, monthly inspections, annual inspections, and special inspections. Proposed inspections are summarised under "Proposed Controls" in Table 2 below. Any abnormalities will be reported immediately for action and an incident report completed.

2.3 TSF Annual Audit and Review

In accordance with condition 27 of the licence L4680/1988/13, an annual audit and review report was submitted to the department and DMIRS on 31 January 2022. The report comprised an overview of works at TSF3 undertaken in 2021, including an assessment of a water balance, monitoring results, visual inspection of TSF3 and recommendations (CMW Geosciences 2022).

Following an assessment of the report by DMIRS, recommendations were provided. As part of this licence amendment, the Delegated Officer has considered recommendations relevant to the management of emissions and discharges from TSF3, and where applicable, has conditioned them in the licence appropriately.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020b).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction works of TSF3 Cell A (Stage 4) embankment lift	Air / windborne dispersion	• Water carts to be used to control potential dust emissions
Noise			• No controls proposed
Operation			
Tailings containing weak acid dissociable cyanide and elevated metals	Operation of TSF3 Cell A (Stage4) design height of 405.0 m RL	TSF embankment failure	• Embankment downstream slope covered with rock armour to protect from erosion if required. • Checks for signs of erosion after rainfall events. • Crest sloped inwards to shed water (rainwater) into the TSF. • Daily visual inspections. • Embankment monitoring using eight vibrating wire piezometers (VWP201-VWP208). • Settlement pins will be used at maximum 200m spacing for measuring vertical deformation. • High resolution surveys to be conducted every six months from an unmanned aerial vehicle (UAV) or drone. • Independent annual audits of the TSF.
	Deposition of tailings into TSF3 Cell A	Tailings seepage through base and embankments into soil and groundwater	• Utilisation of monitoring bores in and around the tailings storage to measure groundwater levels and quality. • Minimise decant pond on TSF at all times. • Daily routine inspection of the embankments. • Recovery of seepage water back to supernatant pond or to the process plant. • Independent annual audits of the TSF.
		Direct discharge to land via tailings overtopping from Cell A	• Decant water pond is kept to a minimum. • Minimum operational freeboard is kept to 300 mm. • Daily inspections. • Special inspection be performed after significant rainfall events and after an

Emission	Sources	Potential pathways	Proposed controls
			earthquake event. • Implementation of Tailings Spill Management Plan.
	Transferring tailings and underdrainage tailings through pipelines	Direct discharge of tailings slurry or saline return water to land	• Construction of bunded pipeline corridor. • Use of automated leakage detection system. • Regular daily inspection of TSF, tailings and return water pipelines and decant inlet.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020b), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020a)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Town of Coolgardie	3 km southwest of the premise.
Pastoral activities	The freehold land on which the TSF is located is surrounded by pastoral leases and used for stock grazing.
Environmental receptors	**Distance from prescribed activity**
Native Vegetation	Open Eucalyptus woodland comprising marri, wandoo and rivergum, abuts the premise on the northern, eastern and southern boundaries.
Protected Ecosystems	Kangaroo Hills Timber Reserve, 6 km southwest of premises.
Surface Water Bodies	Brown Lake is an ephemeral salt lake, located 6 km to the east of the premises. It forms part of a chain of lakes, including Red Lake, Blue Lake, White Lake and Douglas Lake (in order of increasing distance from the premises).
Groundwater	Regional aquifer is sub-vertical, disconnected fractured rock aquifer. Known to be either saline or hypersaline, with no known source of freshwater. Regional groundwater level is not known. Groundwater mounding is occurring at the premises due to seepage from the TSF. Groundwater monitoring indicates that standing water level ranged from 3.1 mbgl to 28.1 mbgl (2019-2020). Generally, groundwater is shallower on the southern perimeter, compared to the eastern perimeter. No monitoring

	bores are present on the northern or western perimeter of the TSF. Localised groundwater contains fluctuating levels of TDS, between 5,700 mg/L to 90,000 mg/L, with recent groundwater monitoring indicating a similar range of between 10,000 mg/L to 110,000 mg/L, reflecting the TDS concentration of decant water. Water is not used for potable purposes and has limited uses, such as for mining processing. There are no groundwater bores registered within 2.5 km of the TSF.
Cultural receptors	**Distance from prescribed activity**
Aboriginal heritage places	A number of Aboriginal heritage places are • Kurkutjutana (ID 3009) – 1.3 km southwest of the premises. • Kurrkurti (ID 1475) – 2.3 km southwest of the premise. • Roundhead/Ngumarn (ID 32761) – 2.5 km west of the premises. • Kurlkuli/Coolgardie Lookout (ID 32759) – 3.2 km southwest pf the premises • Coolgardie Stones (ID 1568) – 3.3 km southwest of the premises. • 568 Mile Peg (ID 1745) – 5.5 km northeast of the premises.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020b) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in

Table **4**.

The Revised Licence L4680/1988/13 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 4. Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					**Risk rating[1]** **C = consequence** **L = likelihood**	**Licence Holder's controls sufficient?**	**Conditions[2] of licence**	**Justification for additional regulatory controls**
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Construction of TSF3 Cell A embankment raise, involving machinery and vehicle movements	Dust	Air/windborne pathway, causing impacts to health, environment and amenity	Town of Coolgardie (3km to the southwest) Native vegetation and protected ecosystems	Refer to Section 3.1.1	C = Slight L = Unlikely **Low Risk**	Yes	Condition 8: Construction requirements for TSF3 Cell A (Stage 4)	Licence Holders controls have been conditioned. Potential dust emissions are required to be minimised using water carts
	Noise			Refer to Section 3.1.1	C = Slight L = Unlikely **Low Risk**	Yes	N/A	No regulatory controls required due to low risk. *The Environmental protection (Noise) Regulations 1997* apply.
Operation (including time-limited operations)								
Deposition of tailings into raised TSF3 Cell A	Tailings seepage	Seepage through floor and embankment of TSF3 to groundwater causing groundwater mounding and surface expression of hypersaline groundwater, resulting in impacts to ecological health	Native vegetation and soil Groundwater	Refer to Section 3.1.1	C = Moderate L = Possible **Medium Risk**	Yes	**Condition 4**: Additional infrastructure requirements for TSF3 **Condition 6**: Additional requirements for TSF management Condition 7: Inspection requirements Condition 8: Construction requirements for TSF3 Cell A (Stage 4) **Condition 10**: Specified actions for maintaining VWPs and seepage sump Condition 17: Monitoring of volumes of seepage recovered **Condition 18**: Target and additional monitoring bores added for ambient groundwater monitoring. **Condition 23**: Additional reporting requirements added for Environmental Report	Refer detailed risk assessment in Section 3.3

	Tailings release – TSF overtopping	Direct discharge of tailings slurry to land, resulting in impacts to health and amenity	Native vegetation and soil Pastoral activities	Refer to Section 3.1.1	C = Moderate L = Unlikely **Medium Risk**	Yes	Condition 5: Freeboard requirement Condition 7: Inspection requirements Condition 17: Monitoring of volume of tailings deposited and water recovered from TSF **<u>Condition 27</u>**: Additional reporting requirements added for Annual Audit Review Report	The Delegated Officer considers that the applicant controls, summarised in section 3.1, are sufficient to mitigate any impacts from overtopping of tailings from TSF Cell A (Stage 4). Those controls have been conditioned as existing conditions 5 (freeboard requirements) and 7 (TSF inspections) in the current operating licence in accordance with *Guidance statement: Risk Assessments (DER 2017)*. Condition 8 has been updated to ensure this TSF lift is constructed in accordance with specifications outlined in application document.
	Tailings/saline water release – pipeline leak or rupture	Direct discharge of tailings slurry or saline return water to land, resulting in impacts to environment.		Refer to Section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Yes	Condition 3: Pipeline construction requirements Condition 7: Inspection requirements	The premises licence has existing condition 3 relating to the regulation of spills and leaks from pipelines. These include the requirement that all the pipelines need to be bunded, equipped with telemetry, pressure sensors and automatic cut-outs. In addition, Condition 7 includes the requirement for pipeline inspection every 12 hours to ensure integrity. Therefore, additional regulatory controls are not required. Condition 8 has been updated to ensure this TSF lift is constructed in accordance with specifications outlined in application document.
	Tailings release – embankment failure	Direct discharge of tailings slurry to land, resulting in impacts to health, environment and amenity.	Native vegetation and protected ecosystems Pastoral activities	Refer to Section 3.1.1	C = Major L = Unlikely **Medium Risk**	Yes	**<u>Condition 4</u>**: Additional infrastructure requirements for TSF3 **<u>Condition 6</u>**: Additional requirements for TSF management, including separation distance between supernatant pond and embankment Condition 7: Inspection requirements Condition 8: Construction requirements for TSF3 Cell A (Stage 4) **<u>Condition 10</u>**: Specified actions for maintaining VWPs and seepage sump Condition 17: Monitoring of volume of tailings deposited and water recovered from TSF. **<u>Condition 18</u>**: Target and additional monitoring bores added for ambient groundwater monitoring. Condition 27: Requirement to submit Annual Audit Review Report	Previous Annual Audits for TSF3 have recommended that the TSF cells should be operated such that the decant pond is located as far away from the perimeter embankments as practical to reduce the risk of embankment failure. The 2021 TSF3 Audit recommended the decant pond within each cell should be managed such that the pond is at least 60m away from the external perimeter embankment. As a result, condition 6 has been revised to require the decant pond to be kept at least 60m away from the TSF embankments at all times. Also, embankment monitoring is carried out using 8 vibrating wire piezometers and settlement pins to identify any deformation in the embankment. In addition to these controls, *The Mines Safety and Inspection Act 1994* and related Regulations apply. The existing licence conditions combined with the applicant's proposed controls are deemed adequate to identify and mitigate any potential risk of embankment failure of TSF3 Cell A.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020b).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **<u>Bold and underline text</u>** depicts additional regulatory controls imposed by department.

3.3 Detailed risk assessment of tailings seepage impacts to groundwater and vegetation

3.3.1 Groundwater quality and standing levels

Groundwater Quality

The quality of groundwater around TSF3 has been monitored over the past years in the eight monitoring bores denoted MB301 to MB308. MB309 to MB312 were installed approximately 300 m south of TSF3 in August 2021, with no groundwater quality results provided at the time of this risk assessment. Monitoring bores MB301, MB302, MB303, MB309 and MB310 provide adequate coverage to monitor any seepage from TSF3 Cell A.

Groundwater around the project area is considered hypersaline and is not used for potable uses. Underlying groundwater at the premises' TSF3 area has recorded a TDS of between 11,000 mg/L and 90,000 mg/L. Groundwater in the area is mainly used for livestock drinking water and mining purposes, though there are no third-party groundwater bore users within 2.5 km of TSF3.

The pH levels in the monitoring bores near TSF3 Cell A ranged from acidic to near-neutral at approximately 3.6 - 7.0. Recent monitoring conducted in June 2021 recorded pH 6.9, 6.4 and 6.8 in MB301, MB302 and MB303, respectively.

Metals and Weak Acid Dissociable Cyanide (WAD CN) concentrations in groundwater are monitored on a quarterly basis as required by the operating licence L4680/1988/13. WAD CN concentrations in the monitoring bores have been recorded between <0.004 mg/L to 0.14 mg/L. The latest readings in June 2021 recorded WAD CN levels as <0.004 mg/L in MB301, MB302 and MB303, which is below the operating licence limit of 0.5 mg/L.

Most of the metal concentrations were within or below the ANZECC (2000) livestock drinking water guideline trigger values. Some exceptions were noticed in Arsenic (As) concentrations within monitoring bores MB301, MB302 and MB303. Recent testing detected that elevated As levels in MB301 is ranging between 2.4 - 2.7 mg/L. Nickel (Ni) concentrations were detected ranging between 0.46-0.85 mg/L, however all levels were below the ANZECC (2000) livestock drinking water guideline value of 1.0 mg/L.

Standing Water Levels

Based on the supporting information provided (periods between September 2018 to June 2021), current groundwater standing water levels in the monitoring bores around the TSF ranges between 3.1 mbgl to approximately 31.6 mbgl (Figure 3). The existing licence sets a limit for standing water levels (SWL) in all groundwater monitoring bores of a maximum water level of 4 meters below ground level (mgbl) to minimise any potential impacts to localised groundwater-dependent vegetation communities. Standing water levels are currently compliant with the licensed limit, except for a breach that occurred at MB304 where the water levels rose to 3.1-3.8 mbgl between October 2019 to March 2020. Since 2017, all bores have shown an increasing trend in SWLs, as shown in Figure 3. This increase ranged from 1.9 m in MB302 and MB305 to 16.9 m in MB307 between September 2018 to August 2021.

Rising groundwater has the potential to inundate root zones of nearby vegetation. Local groundwater is saline (i.e., TDS >10,000 mg/L), which may potentially result in vegetation deaths. The Delegated Officer notes that the Licence Holder has installed groundwater extraction pumps in MB302, MB304 and MB305 in June 2020, in addition to the existing sumps as a preventative measure against water levels rising above 4.0 mbgl. The sumps and repurposed monitoring bores have been used to collect the recovered leachate and incidental seepage water and are pumped back to the mill operations via an HDPE lined water return dam located southeast of TSF3.

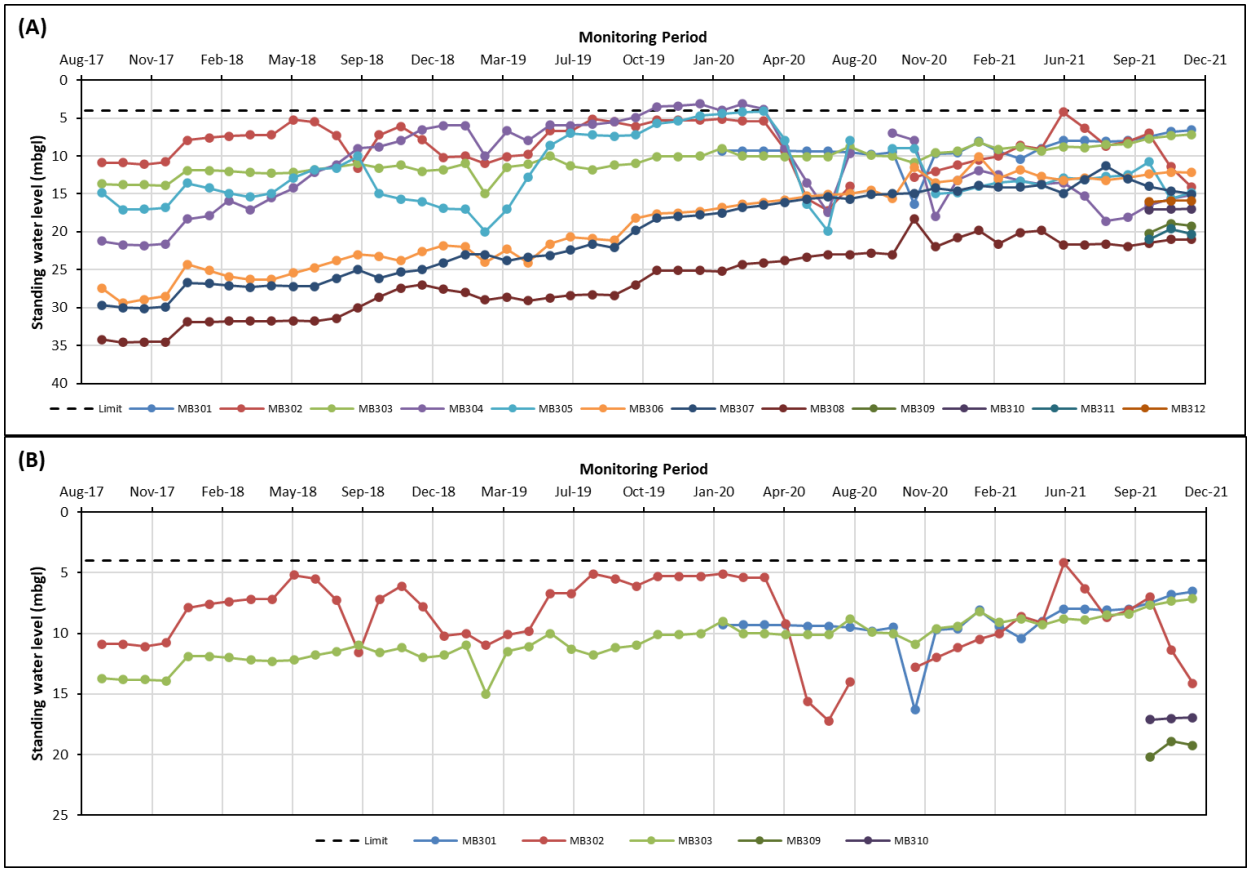

Figure 3: Standing water level from September 2017 to November 2021 at (A) all groundwater monitoring bores and (B) TSF3 Cell A monitoring bores (CMW Geosciences 2022)

Overall, monitoring bores near TSF3 Cell A (i.e., MB301, MB302, MB303) had relatively higher SWLs, compared to the other monitoring bores (Figure 3A). Similarly, VWPs near TSF3 Cell A indicated an increase in pore pressures before stabilising. These increases coincided with the most recent embankment raise undertaken at the cell to RL402.5 m.

In 2020, MB302, MB304 and MB305 were the groundwater monitoring bores with the highest SWLs (at the time) (Figure 3). Consequently, these bores were converted to seepage recovery bores to reduce the extent of groundwater mounding, which is evident in the steep decline in SWLs in the following monitoring events. Unlike MB304 and MB305, SWL at MB302 began to rise gradually, peaking again at 4.2 mbgl (June 2021) before decreasing.

At the latest monitoring event (December 2021), monitoring bores MB301 and MB303 have SWLs shallower than seepage recovery bore MB302, at 6.56 mbgl and 7.14 mbgl, respectively. While the licensed limit has not been breached yet, these trends suggest that seepage recovery at MB302 may not be adequate long-term.

Only preliminary SWL data is available at monitoring bores MB309 and MB310 due to the recent installation (Figure 3A). Nevertheless, it is evident that the water table at those bores (i.e., 300 m south of TSF3) were not yet impacted by seepage mounding to an extent that presents a risk to vegetation at the surface. Continued monitoring is required to establish the rate of mounding, if present.

It was noted that monitoring bore MB309 was advanced to a maximum depth of 21.81 mbgl and was found to be dry at the time of drilling (August 2021) and during a post-installation monitoring event (October 2021). However, water was encountered within the bore in subsequent months, with SWL encountered at 19.24 mbgl during the December 2021 monitoring event. Further monitoring will be required to ascertain whether these measurements are a consequence of

gradual mounding in the area.

The Licence Holder has stated that there is no visual evidence in respect to near surface seepage from TSF3 Cell A. For safe operation of TSF3 Cell A, embankments will be examined for cracking, damp areas, erosion and any signs of distress. The Licence Holder also proposes to continue to monitor groundwater levels and chemistry to comply with the operating licence frequency and other conditions. Additionally, the existing tailings management plan sets out the procedures that will be followed for tailings deposition and water recovery to minimise seepage.

The Delegated Officer has reviewed the Licence Holder's proposed controls related to construction and operation of the TSF3 Cell A and considers that potential seepage may increase with the additional pressure due to the construction of this TSF embankment lift. However, seepage management actions and monitoring controls will continue to be implemented to allow corrective actions to be taken as necessary. The Delegated Officer considers the consequence rating for the risk event 'seepage impacts' to be **moderate** due to potential for stress / death of vegetation. A review of the groundwater monitoring SWL data indicates that increasing seepage trends may lead to groundwater mounding into the root zone of nearby vegetation, thus likelihood of vegetation impacts is **possible**. The final risk rating for this risk event is therefore '**medium**'.

4. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Local Government Authority advised of proposal (07 January 2022)	Not received.	N/A.
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (07 January 2022)	DMIRS replied on 21 January 2022 stating that, given that the TSF is located on freehold title land it is not subject to the provisions of *the Mining Act 1978.* However, it is subject to *the Mines Safety and Inspection Act 1994.* Geotechnical advice was received from DMIRS on 5 July 2022, stating that the application mostly complies with the relevant Codes of Practice and Guidelines and provided relevant conditions for consideration.	The department has requested a signed copy of the "*Certificate of Compliance – Tailings Storage Facility Design*" from the Licence Holder, to ensure full compliance to the relevant Codes of Practice and Guidelines.
Licence Holder was provided with draft amendment on 8 July 2022.	No comments provided. Addressed all outstanding matters in the draft licence, including the provision of updated figures and a Certificate of Compliance for TSF3 Cell A Stage 4 Design Report.	The department has assessed all the outstanding information provided and included them in the amended licence accordingly.

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined

that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 6 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 6: Summary of licence amendments

Condition no.	Proposed amendments
All conditions	Revised to current licensing format (e.g., 'Licensee' to 'Licence Holder', 'shall' to 'must').
Condition 4	Updated Table 1 to: • Include infrastructure requirements for seepage recovery bores, underdrainage system, downstream toe drain and seepage sumps; and • Include infrastructure location for all containment point reference.
Condition 6	Updated to improve clarity and include requirement for 60 m of separation distance between supernatant pond and perimeter embankment.
Condition 7	Updated Table 2 to specify embankment operational freeboard and correct typological error.
Condition 8	Updated Table 3 to remove construction requirements for previously approved embankment raises and to include construction requirements for embankment raise for TSF 3 Cell A to RL405.0 m.
Condition 10	Deleted condition as Seepage Management Plan has been submitted to the department and is now redundant. Updated condition to include Table 4 for specified action, including maintenance and repair of vibrating wire piezometers and seepage sump.
Condition 11	Included new condition 11 to require notification upon completion of works in accordance with condition 10.
Condition 17	Previously condition 16. Updated Table 5 to include monitoring specific monitoring of seepage recovery bores and seepage sumps.
Condition 18	Previously condition 17. Updated Table 6 to include: • Monitoring of MB302, MB304, MB305, MB309, MB310, MB311 and MB312; • Target for standing water level; and • Management action for exceeding target for standing water level.
Condition 21	Previously condition 20. Revised to current licensing format and updated condition based on *Notice of ament and schedule of licences with amended reporting conditions (2022)*.

Condition 23	Previously condition 22. Revised to current licensing format and updated condition based on *Notice of ament and schedule of licences with amended reporting conditions (2022)*. Updated Table 7 to include additional reporting requirements, particularly in relation to ambient groundwater monitoring.
---	Previously condition 23. Deleted existing condition, as the requirements were added to Condition 23 (Table 7).
Condition 25	Updated condition to require reporting requirement for TSF3 Cell A (Stage 4). Reporting requirements for TSF 3 Cell A (Stage 2) and Cell B and C (Stage 5) have been met and are now redundant.
---	Previously condition 26. Deleted existing condition as reporting requirements for TSF 3 Cell A (Stage 3) and Cell B and C (Stage 5) have been met and are now redundant.
Condition 26	Previously condition 27. Updated condition to refer to condition 25.
Condition 27	Previously condition 28. Updated condition for improve clarity and include requirement to include a monthly water balance for TSF in the audit review report.
Condition 28	Previously condition 29. Updated Table 9 to remove reference to N1 form and include notification of non-compliances through the Annual Audit Compliance Report. N1 form is now redundant.
Definitions	Updated to include definition for ‘mbgl’ and ‘suitably qualified professional engineer’.
Schedule 1	Updated Figure 1, Figure 2, Figure 3 and Figure 4 based on most recent site layout and design. Included Figure 5, Figure 6 and Figure 7 for construction of TSF3 Cell A (Stage 4). Previous figures for TSF3 Cell A (Stage 3) and Cell B and C (Stage 6) were removed, including Figure 8.
Schedule 2	Deleted N1 form template as it is now redundant. Updated Schedule to include groundwater monitoring bore and vibrating wire piezometer details.

References

1. Email titled “L4680/1988/13 - BOTANICA CONSULTING - Application for a Licence Amendment for FMR - Greenfields” dated 02/11/2021 authored by Leah Miller, available at DWER records (DWERDT522720).
2. Email titled “L4680/1988/13 - FMR Investments Ptd Ltd - Greenfields Processing Site - Annual Audit and Management Review - Tailings Storage Facility No 3 -CMW Geosciences - 2022-01-22” dated 01/02/2022 authored by Michelle Luinstra, available at DWER records (DWERDT556470).
3. CMW Geosciences 2022, *Annual Audit and Management Review Tailings Storage Facility No.3 Greenfields Mill, Coolgardie, WA*.
4. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020b, *Guideline: Risk Assessments*, Perth, Western Australia.

Appendix 1: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)					
Application type					
Works approval	☐				
Licence	☐	Relevant works approval number:		None	☐
		Has the works approval been complied with?		Yes ☐ No ☐	
		Has time limited operations under the works approval demonstrated acceptable operations?		Yes ☐ No ☐ N/A ☐	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?		Yes ☐ No ☐	
		Date Report received:			
Renewal	☐	Current licence number:			
Amendment to works approval	☐	Current works approval number:			
Amendment to licence	☒	Current licence number:	L4680/1988/13		
		Relevant works approval number:		N/A	☐
Registration	☐	Current works approval number:		None	☐
Date application received					
Applicant and Premises details					
Applicant name/s (full legal name/s)		FMR Investments Pty Ltd			
Premises name		Greenfields Mill			
Premises location		Freehold land Lot 102 on Plan 40393 Premise also includes mining tenement M15/1836. However, this was not specified in the amendment application.			
Local Government Authority		Shire of Coolgardie			
Application documents					
HPCM file reference number:		2013/003899-1~8			
Key application documents (additional to application form):		• **Attachment 1:** Tailings Storage Facility No. 3 Cell A Upstream Embankment Raising from RL402.5m to RL405.0m – Greenfields Mill Design Report for Works Approval Application • **Attachment 1A:** Certificate of Title (Lot 102 on Plan 40393) • **Attachment 2:** Cell A Stage 4 Map • **Attachment 2:** Dividing Wall Map • **Attachment 7:** Location Siting			

Scope of application/assessment	
Summary of proposed activities or changes to existing operations.	*Licence amendment* Construction and operation of upstream embankment lift at Cell A of TSF 3 (from RL402.5m to RL405.0m).

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic or non-metallic ore	**Assessed** – 1,400,000 tonnes per annual period	No change to production or design capacity.

Legislative context and other approvals		
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	N/A. Not a significant proposal.
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	N/A
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	N/A
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Certificate of title ☒ General lease ☐ Mining lease / tenement ☐ Other evidence ☐
Has the applicant obtained all relevant planning approvals?	Yes ☒ No ☐ N/A ☐	The Applicant has not specified what approvals they require but have indicated that they have received all other necessary approvals.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☒	No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☐ No ☒	Licence/permit No: GWL173070(5) Allocation: 1,500,000 kL

Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☒ No ☐	Name: Goldfields Groundwater Area Type: Proclaimed Groundwater Area
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	N/A
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	Mines Safety and Inspection Act 1994
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	Goldfields EPP (Coolgardie) is approximately 3 km southwest of the premise.
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	N/A
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☐ No ☒	Awaiting Classification Date of classification: N/A