



## Application to amend licence

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

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**Works approval number** L6420/1988/14

**Licence holder** Kalgoorlie Consolidated Gold Mines Pty Ltd

**ACN** 009 377 619

**DWER file number** DER2015/002506

**Premises** Fimiston Plant and Tailings Storage Facilities  
  
Mining Tenements G26/15, G26/44-68, G26/70-71, G26/73–78, G26/82-86, G26/99-107, G26/138-145, G26/149, G26/159, G26/160, G26/165, G26/166, L26/267, M26/46, M26/78, M26/86, M26/95, M26/267-268, M26/294, M26/308, M26/326, M26/359, M26/377, M26/383, M26/405, M26/448, M26/451 and M26/715  
  
KALGOORLIE WA 6430

**Date of report** 30 March 2020

**Decision** Licence amended

# 1. Definitions

Key terms relevant to this decision report and their associated definitions are listed in Table 1.

**Table 1: Definitions**

Term	Definition
Amendment Report	refers to this document.
AN1	Amendment Notice 1 (to L6420/1988/14) – issued 15 December 2017
Category / categories	Categories of prescribed premises as set out in Schedule 1 of the EP Regulations
CEO	Chief Executive Officer of the Department of Water and Environmental Regulation
Delegated Officer	An officer delegated under section 20 of the EP Act.
Department	The department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
Emission	has the same meaning given to that term under the EP Act
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of, and during this Review
FSGMP	Fimiston Seepage and Groundwater Management Plan
KSGMP	Kaltails Seepage and Groundwater Management Plan
Licence Holder	Kalgoorlie Consolidated Gold Mines Pty Ltd
mbgl	Meters below ground level
Prescribed premises	This 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
Primary Activities	as defined in Schedule 2 of the Licence
Revised Licence	the amended Licence issued under Part V, Division 3 of the EP Act following the finalisation of this Review
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
SGMP	Seepage and Groundwater Management Plan

## 2. Overview of premises

### 2.1 Classification of Premises

**Table 2: Classification of premises and assessed design capacity**

Category	Description	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	14 500 000 tonnes per year (approved in Amendment Notice 1, issued 15 December 2017)
54	Sewage facility	110m <sup>3</sup> per day
63	Class 1 inert landfill site	15 000 tonnes per year

There are no changes to the above categories or capacities in this amendment.

### 2.2 Description of proposed amendment

On 4 December 2019, the Licence Holder submitted an application to amend licence L6420/1988/14. Amendments requested are:

- authorisation for construction and operation of Fimiston I TSF to Stage 3
- remove management action to increase pumping due to WADCN concentration
- modify management actions to allow for natural recharge
- modification of groundwater compliance zones associated with the Kaltails TSF.

DWER will also incorporate into the Revised Licence, changes authorised under the following amendment notices into licence L6420/1988/14:

- Amendment Notice 1, issued 15 December 2017 for the construction and operation of the Fimiston I TSF and to increase category 5 throughput.
- Amendment Notice 2, issued 6 July 2018 to increase the permitted operational height of the Fimiston II TSF, following completion of the TSF embankment construction works for cells AB, C and D to stage 1 heights.
- Amendment Notice 3, issued 4 April 2019 for progressive embankment raises of the Kaltails TSF, and removal of one groundwater monitoring bore.

Condition 1.3.15 (regarding non-material changes) will also be removed as it is not legally valid.

## 3. Legislative context and other approvals

The legislative framework for this assessment is the *Environmental Protection Act 1986* (EP Act) and *Environmental Protection Regulations 1987* (EP Regulations).

Relevant guidance documents are outlined in **Error! Reference source not found.**

Approvals relevant to the premises are outlined in the table below.

Legislation	Number	Approval
Environmental Protection Act 1986	MS782	Statement that a revised proposal may be implemented – Fimiston Extension (Stage 3) and mine closure planning
Mining Act 1978	Mining Proposal Registration ID: 67695	Approval to construct progressive embankment raises and operate the Fimiston I TSF to a final height of 60m.

## 4. Receptors:

Risk is assessed as a combination of emission sources, the proximity and sensitivity of receptors to those emission sources and any pathways that can allow the emission to reach and potentially harm the receptor. The table below provides a summary of human and environmental receptors in proximity to the premises which have a potential to be impacted from site activities, and the risk assessment in Section 5 considers these receptors in the context of emissions and potential pathways.

Residential and sensitive premises	Distance from Prescribed Premises
City of Kalgoorlie- Boulder	Located at western edge of Fimiston open pit; approximately 3km west from the Fimiston I TSF
Environmental receptors	Distance from Prescribed Premises
Native vegetation (no conservation significant vegetation species; potentially affected vegetation communities widespread regionally)	Adjacent

## 5. Assessment

### 5.1.1 Construction and operation of Fimiston I TSF to Stage 3

The construction and operation of Fimiston I TSF to stage 7 (60m) was assessed in Amendment Notice 1, issued 15 December 2017. However that amendment notice only authorised construction and operation to 46m (stage 2) under condition 1.3.13. Advice was provided to the Licence holder that future stages would be assessed on receipt of a licence amendment application, accompanied by compliance documentation for earlier stages.

This amendment application (4 December 2019) includes signed certification that the Fimiston I TSF raise stage 1 (to 43m) has been constructed in accordance with design and licence conditions.

Review of the two most recent quarterly groundwater reports for the Fimiston TSFs (Q2 and Q3 2019) shows that the Licence Holder is successfully implementing the Fimiston Seepage and Groundwater Management Plan (FSGMP) to keep groundwater levels around the TSF more than 4m below the ground surface. Some bores are reporting depths of between 4 and 6mbgl. This is attributed to natural recharge from rainfall events (see section 5.1.3) and expected to subside naturally over time.

Having received confirmation that stage 1 has been completed as approved, the Delegated Officer has reviewed the Risk Assessment in AN1. The Delegated Officer considers that increasing the authorised operating height to stage 3 does not change any of the risks assessed, though it increases the likelihood that management actions in condition 3.3.2 being triggered. Current regulatory controls remain sufficient to manage these risks. The risk assessment is reproduced in **Table 2** and **Table 3**. This is consistent with the *Guidance Statement: Risk Assessments*.

Existing regulatory controls have been considered in determining the risk rating. Emissions during construction and operation have been assessed separately.

Note that only risks associated with TSF raises have been reproduced here. AN1 also included assessment of an increase in throughput, which is not relevant to the current amendment.

Based on the review of FSGMP referred to above and the risk assessment below, the Delegated Officer will modify Table 1.3.7 to authorise construction and operation of the Fimiston TSF to 49m (stage 3). No additional conditions are required.

**Table 2: 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				
Construction of embankment raises	<b>Dust:</b> associated with construction activities	City of Kalgoorlie-Boulder to the west of the pit (Fimiston I TSF is located to the north east of the Processing plant and east of the pit)	Air	Health and amenity impacts	Minor	Unlikely	Medium	Water trucks in use during construction; supported by an extensive fugitive dust monitoring system with proactive and reactive controls to mitigate impacts on the city (conditioned under the MS782).  The TSF is located away from Kalgoorlie-Boulder.

**Table 3: 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				
Tailings deposition to Fimiston I TSF	Tailings seepage	Surrounding native vegetation	Acidic and hypersaline groundwater mounding in vicinity of the TSF inundating rootzones of vegetation surrounding the TSF	Poor vegetation health	Moderate (no conservation significant vegetation species); potentially affected vegetation communities widespread regionally)	Rare	Medium	Comprehensive seepage recovery system, with network of recovery bores and seepage trenches, supporting by comprehensive groundwater monitoring system to ensure early response to trends indicating increasing groundwater levels. Documented in the Fimiston Seepage and Groundwater Management Plan (FSGMP), which sets targets for standing water levels. FSGMP is audited annually by external hydrogeologist. Local groundwater limits and groundwater monitoring requirements are conditioned in the Licence (condition 3.3.1). Vegetation monitoring over a 15 year period indicated no impact to adjacent vegetation, such that the previous licence condition requiring vegetation monitoring was removed in November 2016.
	Tailings release	Native vegetation Soils <sup>1</sup>	Overtopping of supernatant pond or tailings release during extreme rainfall event	Tailings inundation of adjacent vegetation and soil contamination <sup>1</sup>	Major	Rare	Medium	There is capacity to contain a 12 hour PMP rainfall event as part of the design of Fimiston I TSF even at the end of life of each cell (i.e. when the tailings cell is full prior to next embankment raise) (Golder 2017a). Maximum operating level (MOL) of the pond allows for 12 hour PMP event and this MOL is set by the TSF Operating Manual.

Note 1: It is also noted that significant third party infrastructure (the railway corridor) is located to the east of the Fimiston I TSF and may be impacted by a tailings release. This third party business interruption and safety risk has not been assessed here. Outside the scope of the *Environmental Protection Act 1986*.

### 5.1.2 Remove management action to increase pumping due to WADCN

The Licence Holder requested review of Table 3.3.2 (condition 3.3.2), of which the final line item requires groundwater recovery capacity to be increased in the vicinity of any bore where WADCN exceeds 0.50mg/L.

The Delegated Officer considers that cyanide in groundwater is of lower risk to vegetation receptors than the salinity of that same saline groundwater if mounding occurs in the vicinity of the TSFs, and there are no plausible pathways to other receptors. The Delegated Officer therefore considers that the other management actions in Table 3.3.2 relating to groundwater level trigger values, along with standing water level limits specified in condition 3.3.1, are sufficient to manage any risk posed by elevated cyanide. The Delegated Officer will therefore remove this line item in Table 3.3.2.

WADCN analysis of samples will continue to be required, to allow any trends to be identified.

### 5.1.3 Modify management actions to allow for natural recharge

The Licence Holder presents the case (supported by groundwater level, rainfall occurrence and pumping data) that precipitation events often result in groundwater level rise in some monitoring bores within a few days, which recovers to previous levels over a several months without the need for additional pumping.

Currently, Table 3.3.2 (Condition 3.3.2) contains two tiers of management action requirement. The lower tier applies if groundwater level is less than 6mbgl for the Eastern Borefield and Kaltails Zone A compliance monitoring bores, or less than 2mbgl for the Kaltails Zone B compliance monitoring bores. The current required action at this level is to increase pumping capacity from seepage recovery bores within 9 months.

The licence holder contends that this is not always warranted to manage long term groundwater levels, as it is sometimes due to natural recharge events (in which case levels are likely to drop before the extra pumping capacity is required anyway). Proposed alternate wording is to 'review the potential cause of the change in groundwater and increase pumping capacity within 9 months if cause is directly associated with seepage'.

The Delegated Officer considers that this change would not materially increase the risk to vegetation receptors of saline water entering the root zone, because

- If elevated groundwater level is due to natural recharge, the level is likely to return to previous levels within the 9 month period action period anyway, rendering extra pumping capacity redundant
- If elevated groundwater level is due to seepage, the requirement for extra pumping capacity remains unchanged and
- Should groundwater levels continue to rise, the higher level management actions may be triggered, which remain unchanged by this proposed amendment.

The Fimiston Seepage and Groundwater Management Plan (FSGMP) and the Kaltails Seepage and Groundwater Management Plan (KSGMP) provide a detailed framework for groundwater management on the Premises. These are approved by the CEO in accordance with condition 1.3.5 of the Existing Licence, and annually audited by a suitably qualified professional in accordance with condition 1.3.6.

There are no proposed changes to the higher tier of management actions, applicable if groundwater level is less than 4mbgl for the Eastern Borefield and Kaltails Zone A compliance monitoring bores, or less than 1mbgl for the Kaltails Zone B compliance monitoring bores. The required action is to 'increase pumping capacity within 6 months'.

In the context of approved, detailed SGMPs and the unchanged higher tier management

actions, along with standing water level limits specified in condition 3.3.1, the Delegated Officer considers that there is no material change in the risk to vegetation receptors from the proposed change in management action wording. The change will be made, as proposed by the Licence Holder.

#### 5.1.4 Modify the groundwater compliance zones associated with the Kaltails TSF to accommodate the natural shallow groundwater levels within MB K05

Management of seepage impacts and seepage recovery in the area adjacent to the Kaltails TSF is currently managed via the KSGMP, which is conditioned in the Existing Licence via condition 1.3.5. Two groundwater limits (with corresponding action trigger points) apply in the licence; a 1 mbgl limit for zone B in the area to the south west of the TSF and 4mbgl in the remaining perimeter area adjacent to the TSF (zone A –Figure 1). These limits are in response to the local geology at these locations (with background groundwater levels naturally elevated at Zone B) and also intended to be reflective of the root zones of vegetation that occur in each zone (Zone B has shallow rooted vegetation).

The Licence Holder contends in their amendment application that the zones would be more reasonable defined such that MB K05 falls within zone B. This is supported by data in the application showing natural and current ground water levels (with ongoing pumping) to be around 5mbgl.

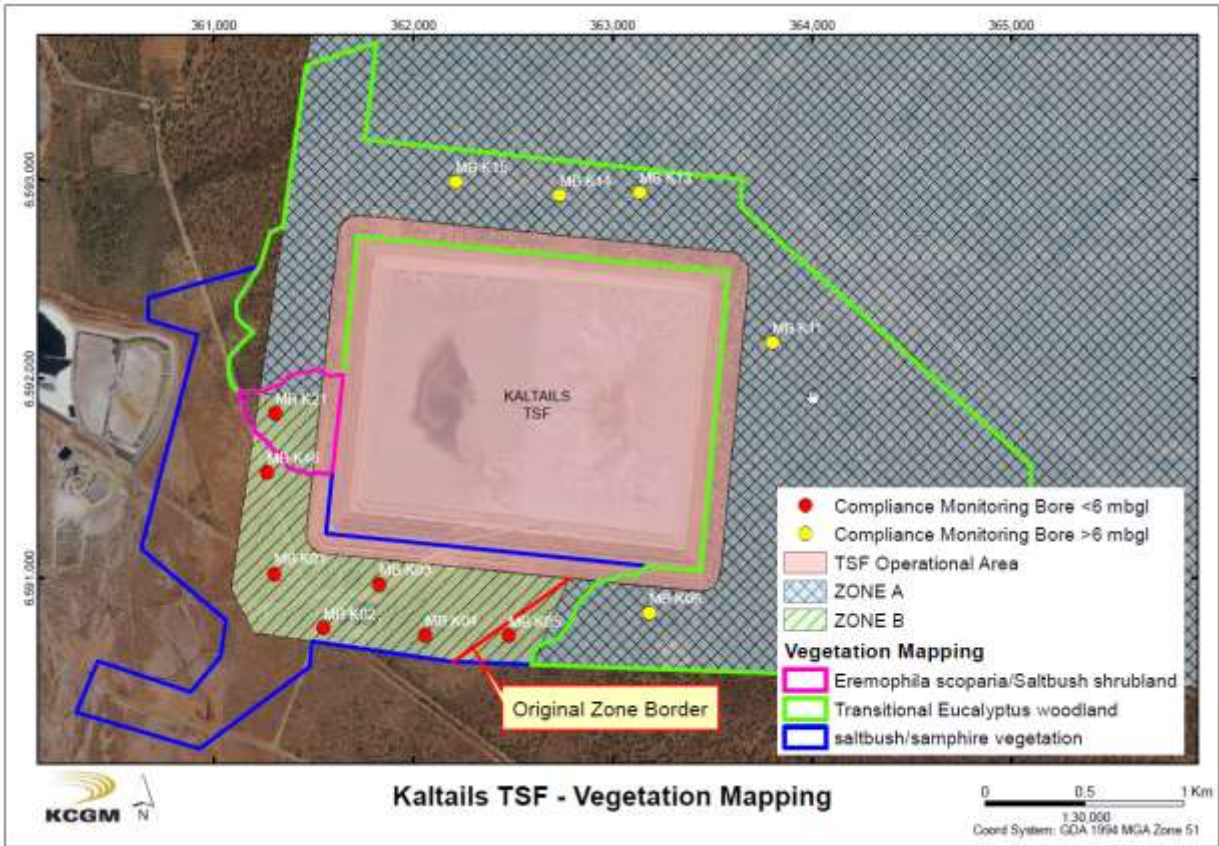
The potential risk in moving the zone boundary is that if deeper rooted vegetation fall into zone B, the shallower allowable depth to groundwater may not be sufficient to keep the saline groundwater out of the root zone, leading to vegetation stress or death. However vegetation mapping was provided by the Licence Holder on 23 January 2020 (KCGM 2020b) (Figure 2) showing the proposed zone boundary relative to vegetation communities, as surveyed in 2009 by Botanica Consulting. This showed that the proposed zone boundary aligns more closely with the vegetation communities than the existing zone boundary, and that MB K05 falls within the region of shallow rooted saltbush/samphire vegetation; which is consistent with the rest of Zone B.

The Delegated Officer considers that as the monitoring data presented is consistent with a natural groundwater level around 5m and the vegetation mapping shows that MB K05 is within the mapped vegetation community characterising Zone B, it is reasonable to redefine the zone boundary as requested to place MB K05 within zone B, rather than zone A.





Figure 1: Kaltails compliance zones in Existing Licence L6420/1988/14



**Figure 2: Proposed Kaltails compliance zones (existing boundary shown as ‘original zone border’), overlain with mapped vegetation communities**

## 6. Consultation

Method	Comments received	DWER response
Application advertised on DWER website (31/01/2020)	None received	N/A
Local Government Authority advised of proposal (31/01/2020)	None received	N/A
DMIRS advised of proposal (31/01/2020)	None received	N/A
Licence Holder referred draft documents (21/2/2020)	<p>(KCGM 2020c)</p> <ol style="list-style-type: none"> <li>Requested removal of map on page 21, and duplicate on p27</li> <li>requested removal of redundant parts of condition 1.3.14</li> </ol> <p>(KCGM 2020d)</p> <ol style="list-style-type: none"> <li>alternate wording for TSF conditions</li> </ol> <p>(KCGM 2020e)</p> <ol style="list-style-type: none"> <li>Updated monitoring location maps provided</li> <li>Mention of landfill categories as requested in A1877821</li> </ol>	<ol style="list-style-type: none"> <li>Removed. These are redundant as works have been completed.</li> <li>Documents stating compliance with these conditions for Stage 1 were received with this application (KCGM 2019). Condition reworded as applicable to subsequent raises only (agreed KCGM 2020e)</li> <li>Cannot amalgamate conditions without reassessment, as approved designs for TSFs may vary.</li> <li>Incorporated</li> <li>Addition of a category requires a separate amendment application, so will not be addressed in this amendment.</li> </ol>

## 7. Conclusion

Based on the assessment in this decision report, the Delegated Officer has determined that the application to amend licence L6420/1900/14 will be granted, with no change to any other condition.

Tim Gentle  
MANAGER, RESOURCE INDUSTRIES  
REGULATORY SERVICES

*An officer delegated by the CEO under section 20 of the EP Act*

## Appendix 1: Key documents

Document title	In-Text Reference	Availability
Email: Application to Amend Licence L6420/1988/14 (14 December 2019)	KCGM 2019	DWER records (A1848117)
Supplementary information for works approval application – email entitled ‘Application to Amend Licence L6420/1988/14’ (6 January 2020)	KCGM 2020a	DWER records (A1857250)
Email: Vegetation mapping around Kaltails TSF and compliance zones (23 January 2020)	KCGM 2020b	DWER records (A1862598)
Email response 1 to draft package (27/02/2020)	KCGM 2020c	DWER records (DWERDT258212)
Email response 2 to draft package (03/03/2020)	KCGM 2020d	DWER records (A1877627)
Email response 3 to draft package (18/03/2020)	KCGM 2020e	DWER records (A1877610)
DER, July 2015. <i>Guidance Statement: Regulatory principles.</i> Department of Environment Regulation, Perth.	DER 2015a	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
DER, October 2015. <i>Guidance Statement: Setting conditions.</i> Department of Environment Regulation, Perth.	DER 2015b	
DER, February 2017 <i>Guidance Statement: Risk Assessments.</i> Department of Environment Regulation, Perth.	DER 2017	
DWER, June 2019 <i>Guideline: Decision Making</i> Department of Water and Environmental Regulation	DER 2019	