Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 3

Licence Number	L6420/1988/14
Licence Holder	Kalgoorlie Consolidated Gold Mines Pty Ltd
ACN	009 377 619
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 Amendment	4 April 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: 2019.04.04 10:09:43 +08'00'

Tim Gentle

Manager Licensing (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 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
CS Act	*Contaminated Sites Act 2003* (WA)
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
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
KCGM	Kalgoorlie Consolidated Gold Mines Pty Ltd
KSGMP	Kaltails Seepage and Groundwater Management Plan

Licence Holder	Kalgoorlie Consolidated Gold Mines Pty Ltd
Licensee	has the same meaning as Licence Holder
m^3	cubic metres
mbgl	metres below ground level
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
Mtpa	million tonnes per annum
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 Amendment Notice applies, as specified at the front of this Amendment Notice.
Risk Event	as described in *Guidance Statement: Risk Assessment*
TSF	Tailings Storage Facility
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.

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)*

Amendment description

Kalgoorlie Consolidated Gold Mines Pty Ltd submitted an application on 21 December 2018 to amend their Licence L6420/1988/14 to authorise:

- Progressive embankment raises of the Kaltails TSF from 44 m to 60 m in height; and
- Removal of one groundwater monitoring bore each from the required monitoring schedule for Kaltails TSF (MB K41), and for Fimiston II TSF (NTD6), due to buttress construction works impacting on these bores. It is planned to replace MB K41 with new bore MB K77. It is not planned to replace NTD6. Refer to the Figure 1 and 2 below for the location of these bores with respect to the buttress works.

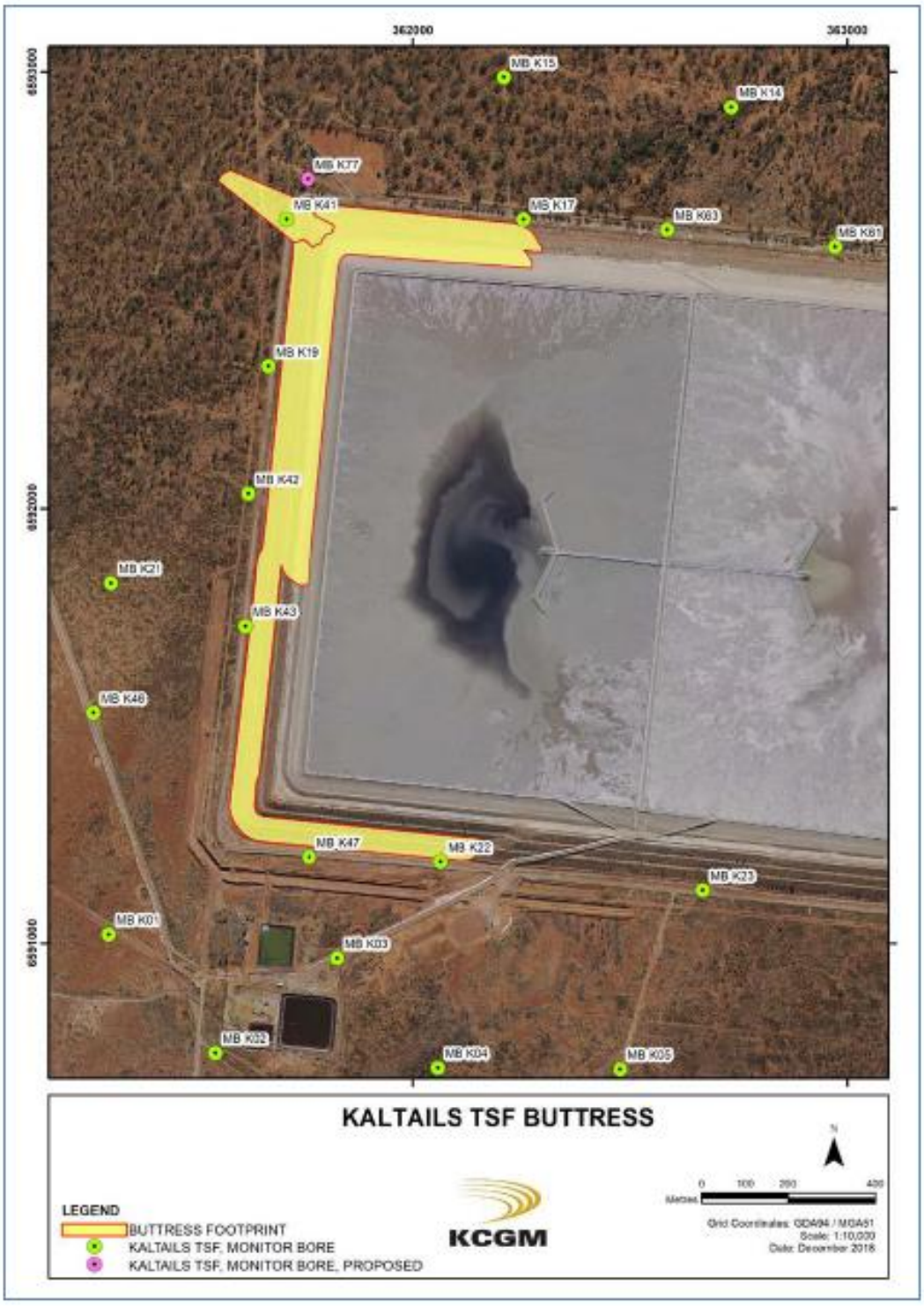


Figure 1: Location of Kaltails TSF buttress and groundwater monitoring bores (new bore MB K77 shown in pink)

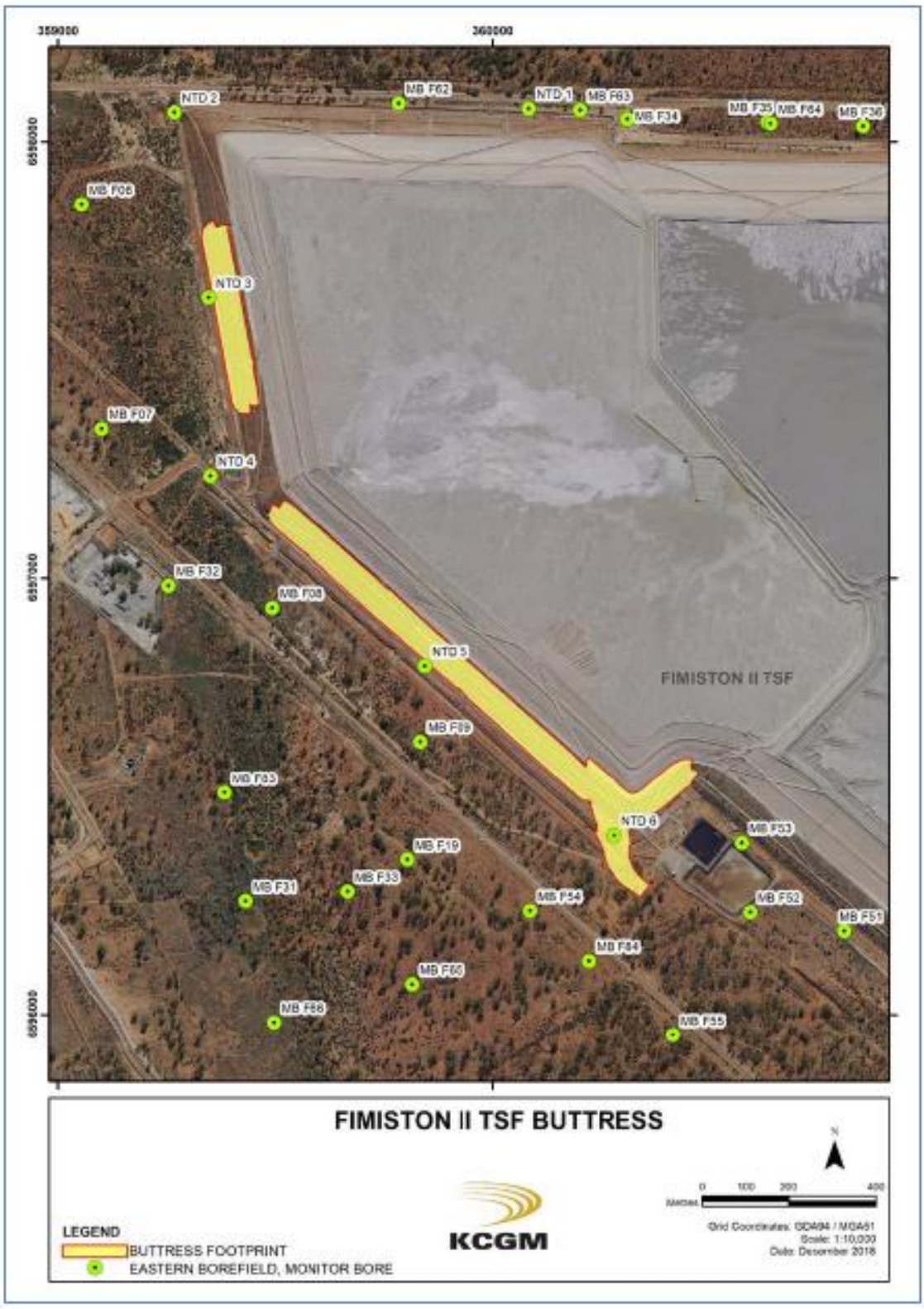


Figure 2: Location of Fimiston II TSF buttress and groundwater monitoring bores

Amendment history

Table 2 provides the amendment history for L6420/1988/14.

Table 2: Licence amendments

Instrument	Issued	Amendment
L6420/1988/14	17/09/2015	Licence amendment to include category 54.
L6420/1988/14	05/04/2016	Licence amendment to authorise progressive embankment raises to Fimiston II TSF and addition of category 63 to construct and operate a Class 1 inert landfill within the Fimiston Waste Rock Dump.
L6420/1988/14	25/11/2016	Licence amendment to remove vegetation monitoring requirements following Licensee submission. Authorisation to dispose of hydrocarbon contaminated waste to Paringa TSF. Administrative changes requested by the Licensee and additional administrative changes made by DER.
L6420/1988/14	15/12/2017	Licence amendment to authorise progressive embankment raises to Fimiston I TSF to a final height of 60m.
L6420/1988/14	06/07/2018	Licence amendment to authorise increase operational height of Fimiston II TSF to Stage 3 heights.
L6420/1988/14	04/09/2019	Licence amendment to authorise progressive raises of the embankment height of Kaltails TSF from 44m to 60m. Amendment to the required groundwater monitoring bores for Kaltails and Fimiston II TSFs in response to buttress works.

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
City of Kalgoorlie- Boulder	Located at western edge of Fimiston open pit; approximately 3km west from the Fimiston II TSF

Risk assessment

Table 4 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.

The risk rating for these risk events has been determined in accordance with the risk rating matrix set out in Table 4 below.

Table 4: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe

Almost certain	**Medium**	**High**	**High**	**Extreme**	**Extreme**
Likely	**Medium**	**Medium**	**High**	**High**	**Extreme**
Possible	**Low**	**Medium**	**Medium**	**High**	**Extreme**
Unlikely	**Low**	**Medium**	**Medium**	**Medium**	**High**
Rare	**Low**	**Low**	**Medium**	**Medium**	**High**

The assessment of the consequence and likelihood of the Risk Event was made in accordance with the criteria in Table 5 below.

Table 5: Risk criteria table

Likelihood		**Consequence**		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		**The following criteria has been used to determine the consequences of a Risk Event occurring:**		
			Environment	**Public health* and amenity (such as air and water quality, noise, and odour)**
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	(i) **onsite impacts**: mid-level (ii) **offsite impacts local scale**: low level (iii) **offsite impacts wider scale**: minimal (iv) Specific Consequence Criteria (for environment) are at risk of not being met	(v) **Adverse health effects:** low level or occasional medical treatment (vi) Specific Consequence Criteria (for public health) are at risk of not being met (vii) **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	(viii) **onsite impacts**: low level (ix) **offsite impacts local scale**: minimal (x) **offsite impacts wider scale**: not detectable (xi) Specific Consequence Criteria (for environment) likely to be met	(xii) Specific Consequence Criteria (for public health) are likely to be met (xiii) **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity (xiv) Specific Consequence Criteria (for public health)

				met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*

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				
Category 5 Processing or beneficiation of metallic or non-metallic ore	Construction of embankment raises	**Dust**: 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 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	Increasing the embankment heights and (consequently the operational height) of Kaltails TSF from 44m to 60m	Seepage from tailings disposal	Adjacent native vegetation	Additional hydraulic head from increasing tailings deposition causing increasing seepage. Acidic and hypersaline groundwater mounding in vicinity of the TSF inundating rootzones of vegetation	Adverse impacts to the health and survival of adjacent native vegetation	Moderate (no conservation significant vegetation species); potentially affected vegetation communities widespread regionally)	Rare	Medium	Refer to the Detailed risk assessment following this table.

				surrounding the TSF					
		Tailings release	Native vegetation Soils	Overtopping of supernatant pond or tailings release during extreme rainfall event	Tailings inundation of adjacent vegetation and soil contamination	Major	Rare	Medium	Golder (2018) confirms the design basis for the operating TSF cell allows for rainfall equivalent to a 1:1000, 72 hour rainfall event (approximately 320mm) plus an additional freeboard of 500mm. Even if the decant pond is at the maximum operating level of 35% of the surface area of the TSF cell (I.e. beyond the target area of 15% of the surface area), the freeboard of 820 mm will be available. Hence the likelihood that the freeboard will be exceeded is considered rare. Inspections of the freeboard are required by licence condition 1.3.4 and specified in the Fimiston Mill Tailings Operating Manual.

Cat 5 Processing or beneficiation of metallic or non-metallic ore	Removing groundwater monitoring bore MB K41 due to buttress works for improving geotechnical stability of the embankments at Kaltails TSF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Whilst the removal of a bore does not change the impact from the tailings seepage, it may impact on the quality of the response in the event of poor monitoring results. BDH (2018a) assessed the impact of removing groundwater bore MB K41 from the monitoring network for Kaltails TSF and recommended replacement with a new bore as it is in a useful position to monitor changes associated with Kaltails west cell deposition and potential artificial recharge from the stormwater pond to the north east. KCGM have committed to installing new bore MB K77 as recommended. Additionally there is no change to the existing compliance bore network, for which the limits in Table 3.3.1 apply.
	Replacing groundwater monitoring bore NTD6 with new bore due to	N/A	N/A	N/A	N/A	N/A	N/A	N/A	BDH (2018b) assessed the net impact of removing NTD6 groundwater bore from the monitoring network

	buttress works for improving geotechnical stability of the embankments at Fimiston II TSF								and judged that it was similar in response to adjacent bores MB F09 and MB F54 and hence was not critical to replace. Condition 3.3.1 of Licence L6420 still applies with limits in compliance bores prescribed. There is no change to the existing compliance bore network.

Detailed risk assessment – Kaltails TSF seepage impacting vegetation

Management of seepage impacts and seepage recovery in the area adjacent to the Kaltails TSF to date has been adequately managed via the Kaltails Seepage Groundwater Management Plan (KSGMP) which is conditioned in the Licence via condition 1.3.5. Annual audits of the plan are required by condition 1.3.6. Two groundwater limits 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 - refer to the Map of monitoring locations 3 following in the Amendment for the locations of these zones). These limits are in response to the local geology at these locations (with background groundwater levels naturally elevated at Zone B) and also reflective of the rootzones of vegetation that occur in each zone (Zone B has shallow rooted vegetation).

A review of the potential seepage impacts from tailings deposition to Kaltails TSF to a height of 60m has been completed by both the TSF Designer (Golder 2018) and the hydrogeological consultant (BDH 2018a). The seepage analysis completed by Golder indicates that the seepage rates are not expected to vary significantly from the current rates of approximately ~10L/s, with a maximum rate of up to 25 L/s. Refer to Figure 3 below.

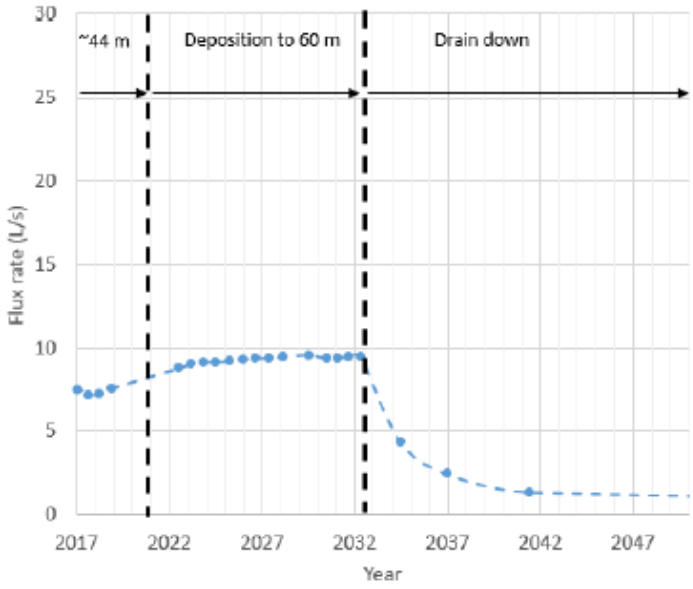


Figure 3: Summary of modelled seepage flux through base of TSF (Golder 2018)

The model anticipates that the 1 mbgl limit in Zone B can be met at all times during deposition and at closure. The closure plan allows for 10 years of groundwater abstraction post closure in order to reduce the risk of vegetation rootzone inundation. Predicted groundwater elevations are shown in Figure 4 below:

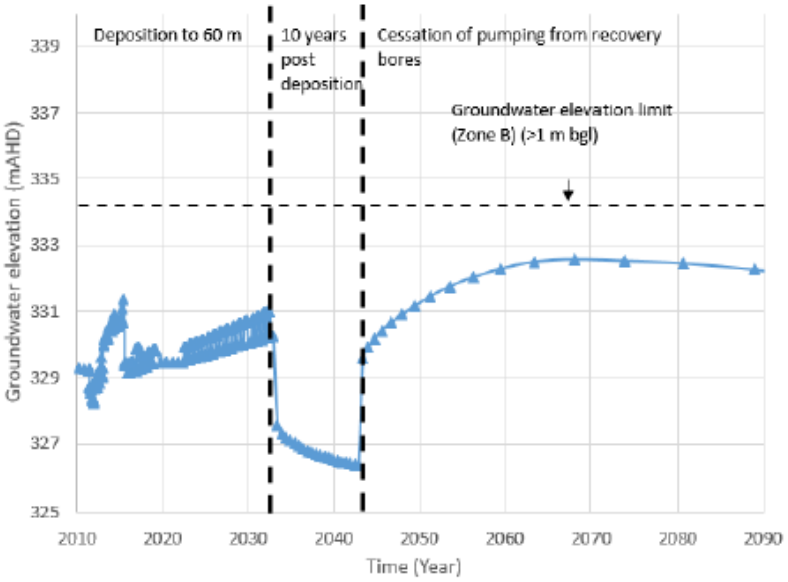


Figure 4: Predicted groundwater elevation at downstream toe (adjacent to MB K43) (Golder 2018)

The hydrogeological consultant's review (BDH 2018a) of the impact of the proposed height increase to 60m noted that there was potential for the 1 mbgl Zone B limit to be breached dependent on rainfall recharge and operational constraints (for example during processing plant shut-downs), however careful management of the production bores and response to groundwater data should ensure that the Kaltails Seepage and Groundwater Management Plan (KSGMP) remained effective to meet the groundwater limits for the facility.

Existing controls for the KSGMP remain in place and are conditioned on the Licence, including the requirement for an annual audit of the plan's effectiveness and adequacy of its objectives. A series of groundwater recovery (production) bores are installed in the vicinity of the Kaltails area to manage groundwater levels to below the 4 mbgl and 1 mbgl limits for compliance bores. These limits are conditioned via Licence condition 3.3.1. Quarterly and annual monitoring of groundwater levels and quality is required by condition 3.3.1. This data must be reported on a quarterly basis to DWER via condition 4.2.2. The hydrogeological review completed of the Kaltails TSF

Further the area of the supernatant ponds on each cell of Kaltails TSF is targeted to remain below 15%, in order to reduce seepage. The sizing of each pond is reported to DWER via the quarterly groundwater monitoring reports.

Decision

Kaltails Height Increase to 60m

The proposed height increase for Kaltails TSF to 60 m is approved. This decision is made cognisant that existing Licence Holder controls for the operation of Kaltails TSF are conditioned on the Licence to ensure that the freeboard is sufficient to capture extreme rainfall events and that seepage from the increasing height of the facility is adequately managed via a responsive seepage and groundwater management plan. Quarterly groundwater monitoring reports submitted in accord with condition 4.2.2 have consistently demonstrated that the seepage impact is managed adequately via the Kaltails Seepage and Groundwater Management Plan.

Groundwater level limits are imposed on the Licence via condition 3.3.1 with respect to the local geology and vegetation found in each zone are considered appropriate.

Conditions currently on the Licence capture operational emissions relating to management of

freeboard (condition 1.3.4) and seepage (conditions 1.3.5, 1.3.6, 3.3.1 and 4.2.2). Condition 1.3.16 has been added to the Licence in this amendment to permit the increase in construction and operating heights to 60m, acknowledging that the embankment raises are progressively increased in 1.5m increments (Golder 2018). KCGM will be required to submit compliance documents following completion of each stage listed in Table 1.3.9 as per condition 4.2.3, consistent with requirements for Fimiston I and Fimiston II TSFs.

Modifications to the groundwater monitoring bore networks – Fimiston II TSF and Kaltails TSF

Given the reviews by the hydrogeological consultant (BDH 2018a, BDH 2018b) and the replacement of MB K41 with MB K77, the removal of MB K41 and NTD6 is approved. The Maps of Monitoring Locations 2 and 3, and Table 2 of Schedule 1 of the Licence will be updated accordingly.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 2/4/2019. No comments were received from the Licence Holder and a waiver requested on for the remaining consultation period.

Amendment

1. Condition 1.1.2 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:

'CEO' for the purpose of correspondence means;

Director General
Department Administering the *Environmental Protection Act 1986*
~~Locked Bag 33 CLOISTERS SQUARE~~ Locked Bag 10
~~Perth WA 6850~~ Joondalup DC, WA 6919
~~info-der@dwer.wa.gov.au~~ info@dwer.wa.gov.au

2. Condition 1.3.15 of the Licence is amended by the insertion of text shown in red underline below:

1.3.15 The Licensee must not depart from the requirements specified in Tables 1.3.8 and 1.3.10 except:

(i) where such departures are minor in nature and do not materially change or affect the infrastructure; or

(ii) where such departures improve the functionality of the infrastructure and do not increase the risks to public health, public amenity or the environment.

If (ii) applies, then the Licensee must provide the CEO with a list of departures and demonstrate that these have not increased the risk to public health, public amenity or the environment.

3. Condition 1.3.16 is added to the Licence as shown below:

1.3.16 The Licensee is authorised to construct embankment raises and operate the Kaltails TSF to the heights as listed in Table 1.3.9 below:

Table 1.3.9: Kaltails TSF Construction & Operating Heights			
Stages	**TSF Cell**	**Construction Height (m)**	**Operating Height (m)**
Stage 1	West	44	44
	East	44	44
Stage 2	West	47	47
	East	47	47
Stage 3	West	50	50
	East	50	50
Stage 4	West	53	53
	East	53	53
Stage 5	West	56	56
	East	56	56
Stage 6	West	60	60
	East	60	60

4. The Licence is amended by the insertion of the following Condition 1.3.17:

1.3.17 The Licensee shall ensure that the embankment raises' infrastructure specified in column 1 of Table 1.3.10 is constructed in accordance with the requirements specified in column 2 of Table 1.3.10.

Table 1.3.10: Construction of Kaltails TSF Embankment Raises	
Column 1	**Column 2**
Infrastructure	**Requirements**
Upstream perimeter embankment raises	• In accordance with the Fimiston Mill Tailings Operating Manual (Golder 2013, and subsequent revisions). Typical embankment section as per Figure 5 (Golder 2018 Figure F004) below. • Construction to be supervised by an engineering or geotechnical specialist.
Decant tower and access causeway	Relocate the decant tower and causeway. Typical decant causeway raise section as shown in Figure 5 (Golder 2018 Figure F004) below.
Areas subject to construction activities	Control dust by using water carts to wet down work areas.

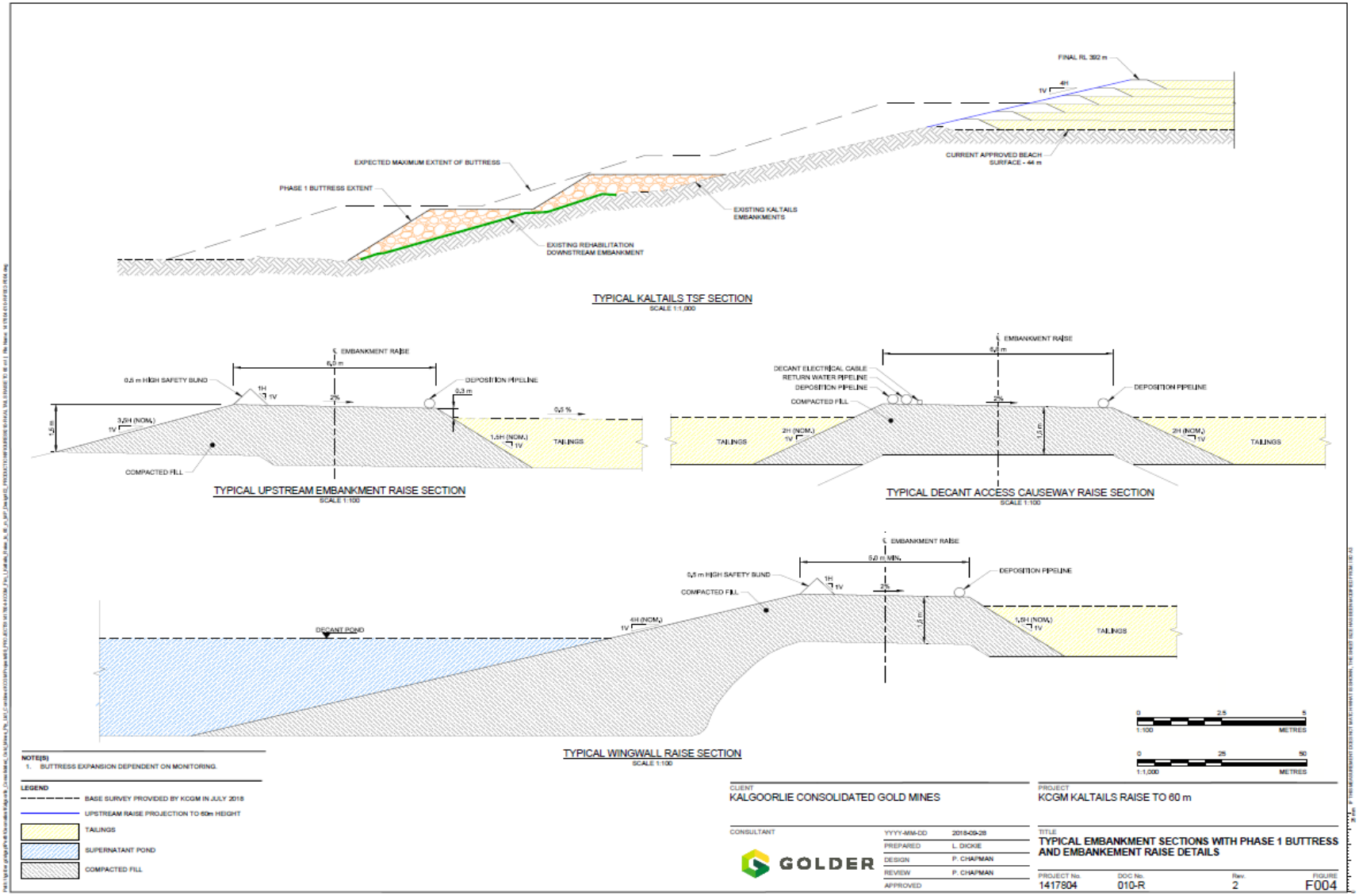
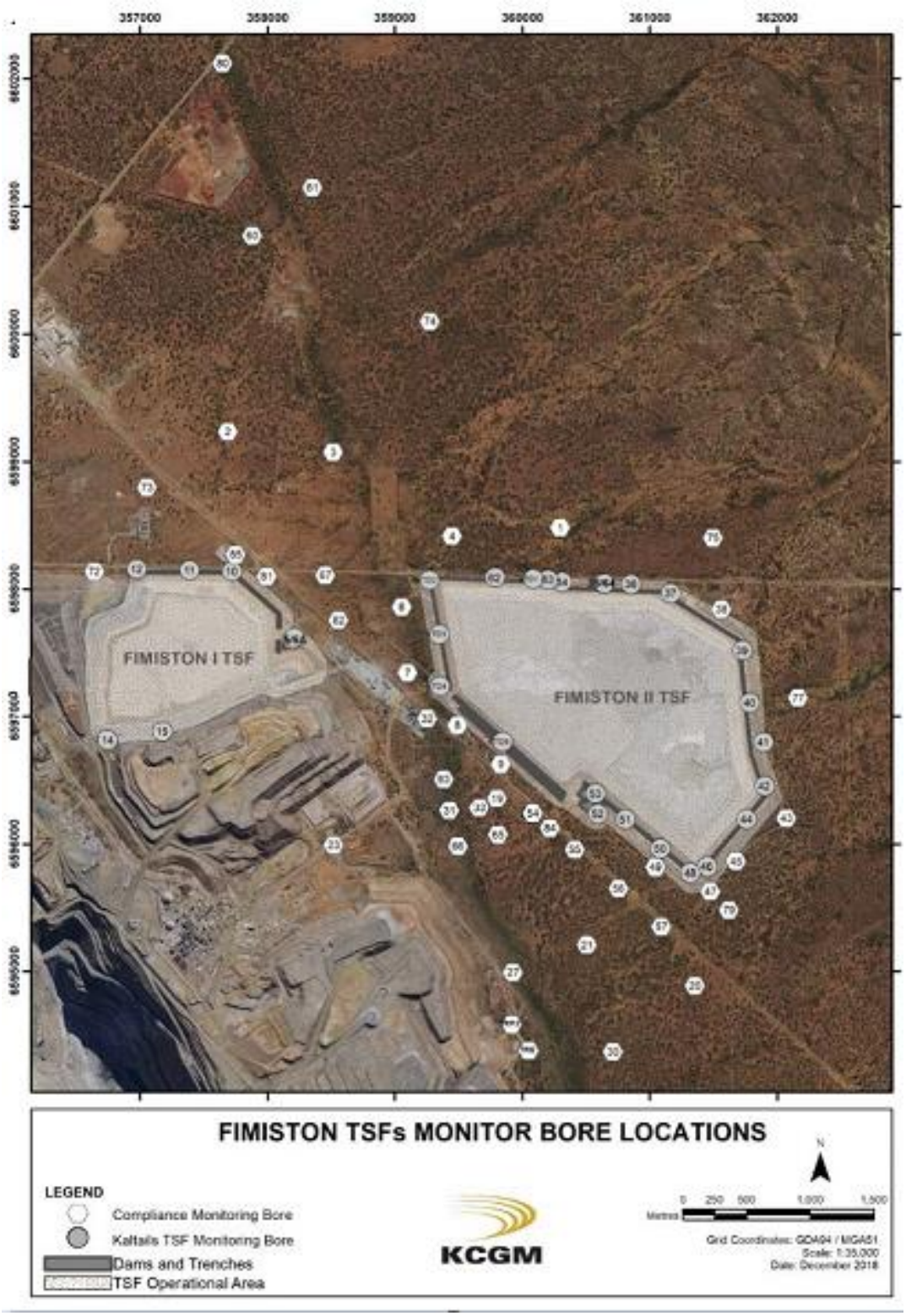


Figure 5: Typical embankment sections with Phase 1 buttress and embankment raise details (Golder 2018)

5. Condition 4.2.3 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:

4.2.3 The Licensee shall submit a construction compliance document to the CEO within 90 days of completion of each stage of the works as listed in Table 1.3.3, ~~and~~ Table 1.3.7 and Table 1.3.9.

6. The Map of monitoring locations 2 in Schedule 1 of the Licence is replaced by the map as shown below:



7. The Map of monitoring locations 3 in Schedule 1 of the Licence is replaced by the map as shown below:

8. Table 2 of Schedule 1 is amended by the deletion of text shown in strikethrough and the insertion of red text in underline as shown below:

Table 2: All groundwater monitoring sites								
Eastern Borefield Dams And Trenches								
Decant 1	Decant 3	Fimiston I Nth Trench	Fimiston II Sth Trench					
Kaltails Dams and Trenches								
Decant 4	Kaltails Seepage Interception Trench							
Eastern Borefield Monitoring Bores								
MB F1	MB F10	MB F27	MB F39	MB F49	MB F61	MB F74	MB F84	TRP 2
MB F2	MB F11	MB F30	MB F40	MB F50	MB F62	MB F75	MB F85	
MB F3	MB F12	MB F31	MB F41	MB F51	MB F63			
MB F4		MB F32	MB F42	MB F52	MB F64	MB F77	NTD 1	
MB F5	MB F19	MB F33	MB F43	MB F53	MB F65		NTD 2	
MB F5A	MB F20	MB F34	MB F44	MB F54	MB F66	MB F79	NTD 3	
MB F6	MB F21	MB F35	MB F45	MB F55	MB F67	MB F80	NTD 4	
MB F7	MB F23	MB F36	MB F46	MB F56		MB F81	NTD 5	
MB F8		MB F37	MB F47	MB F57	MB F72	MB F82	~~NTD 6~~	
MB F9		MB F38	MB F48	MB F60	MB F73	MB F83	TRE	
Kaltails TSF Monitoring Bores								
MB K01	MB K05	MB K14	MB K21	MB K25	MB K46	MB K56	MB K61	MB K67
MB K02	MB K06	MB K15	MB K22	~~MB K41~~	MB K47	MB K57	MB K63	MB K77
MB K03	MB K11	MB K17	MB K23	MB K42		MB K58	MB K65	
MB K04	MB K13	MB K19	MB K24	MB K43		MB K59	MB K66	

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L6420/1988/14 – KCGM Fimiston Plant	L6420/1988/14	accessed at www.dwer.wa.gov.au
2	Talis (2018) *KCGM Mining Proposal - Kaltails TSF Height Increase to 60m*, November 2018	Talis 2018	DWER record (A1755590)
3	Licence Amendment Application submitted 21 December 2018	Application	DWER record (A1755591)
4	Golder (2018) Design Report to Support Application for Height Increase to 60m, Kaltails Tailings Storage Facility, September 2018	Golder 2018	Appendix A to DWER record (A1755590)
5	Big Dog Hydrogeology (2018a) *KCGM Hydrogeological Review of the proposed Raise of the Kaltails TSF*, September 2018	BDH 2018a	DWER record (A1755593)
6	Big Dog Hydrogeology (2018b) Memorandum to KCGM Re: Hydrogeological Implications for Fim II TSF Buttress, dated 10 December 2018	BDH 2018b	DWER record (A1755592)
5	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
7	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	DER 2016a	
8	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2016b	
9	DER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DER 2016c	