Amendment Report

Application for Licence Amendment

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

Licence Number	L8644/2012/1
Licence Holder	Big Bell Gold Operations Pty Ltd
ACN	090 642 809
File Number	2012/002162-1
Premises	Cue Gold Operations – Tuckabianna Project Mining Tenements: M20/55, M20/108, M20/111, M20/176, M20/183, M20/195, M20/208 and M20/247 CUE WA 6640 As defined by the Premises map attached to the Revised Licence
Date of Report	21 October 2022
Decision	Revised licence granted

Carmen Standring

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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 L8644/2012/1 is held by Big Bell Gold Operations Pty Ltd (Licence Holder) for the Cue Gold Operations – Tuckabianna Project (Premises), located at Mining Tenements: M20/55, M20/108, M20/111, M20/176, M20/183, M20/195, M20/208 and M20/247 CUE WA 6640 .

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 the Premises. As a result of this assessment, Revised Licence L8644/2012/1 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 14 April 2022, the Licence Holder submitted an application to the department to amend Licence L8644/2012/1 (L8644) under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Discharge an additional 252,288 tonnes of dewatering wastewater into the Friars mined pit over a 12 month period. The source of the dewatering wastewater is from dewatering activities at the Comet Project (EP Act Licence L8978/2016/1) located 5km west of the Premises, which is also owned by the Licence Holder.
- Increase the embankment height at the existing Tuckabianna Tailings Storage Facility 2 (TSF2) by an additional 5 metres through two 2.5-meter upstream lifts.

2.3 Infrastructure and operational aspects

Discharge into the Friars Pit

The discharge of dewatering wastewater into the Friars Pit is already an approved licenced activity at the Premises. However, the current approval only relates to dewatering wastewater generated at the Premises and not from external sources as proposed by the Licence Holder.

The Licence Holder is seeking approval to receive wastewater generated at the nearby Comet Project (5km to the west) and discharge the wastewater into the Friars Pit for future use in the Tuckabianna Processing Plant and for dust suppression.

Dewatering operations at the nearby Comet Project are expected to occur over a 2 year period with discharge from the Comet Project to the Premises (Friars Pit) not expected to commence until the 13th month of operations. A total of 252,288 tonnes of wastewater is expected to be discharged into the Friars Pit over this period. The calculated available capacity of the Friars Pit is expected to be 1,401,159 tonnes when dewatering discharge commences. The final pit water level is expected to be at 407.7mRL. The Friars Pit crest level is 441.3mRL, a difference of 33.6 metres. Outflows for use in the process plant and for dust suppression are expected to balance with the discharge amounts and therefore the water volume within the pit is expected to remain unchanged. Figure 1 below provides a water balance for the Friars Pit.

Discharge into the Friars Pit will be through a high density polyethylene (HDPE) pipeline located over the pit crest. Recovery of water from the pit for use in the Tuckabianna Processing Plant and for dust suppression will be through existing pumping and pipeline infrastructure.

Figure 1: Water balance for wastewater discharge into the Friars Pit

Month	Comet North Pit	Comet Pit	Eclipse Pit		Venus Pit	Friars Pit (maximum water capacity is 2,067,780kL. The pit crest is at 441.3mRL)				
	Maximum Abstracted Volume (kL)	Maximum Abstracted Volume (kL)	Maximum Receiving Volume (kL)	Transfer to Venus / Friars (kL)	Maximum Receiving Volume (kL)	Maximum Receiving Volume (kL)	Abstracted Volume – Dust Suppression (kL)	Transferred Volume – Tuckabianna Mill (kL)	Estimated Pit Water Volume (kL)	Estimated Pit Water Level (mRL)
1	0	15,833	15,833	21,024	21,024	0	14,273	0	666,621	410.5
2	0	15,833	15,833	21,024	21,024	0	14,273	0	659,194	410.3
3	91,980	12,667	104,647	21,024	21,024	0	14,273	0	651,767	410.0
4	91,980	12,667	104,647	21,024	21,024	0	14,273	0	644,340	409.8
5	86,446	12,667	99,113	21,024	21,024	0	14,273	0	636,913	409.5
6	10,512	12,667	23,179	0	0	0	14,273	0	629,486	409.3
7	10,512	12,667	23,179	0	0	0	14,273	0	622,059	409.0
8	10,512	12,667	23,179	0	0	0	14,273	0	614,632	408.7
9	10,512	12,667	23,179	0	0	0	14,273	0	607,205	408.5
10	10,512	12,667	23,179	0	0	0	14,273	0	599,778	408.2
11	10,512	12,667	23,179	0	0	0	14,273	0	592,351	408.0
12	10,512	12,667	23,179	21,024	21,024	0	14,273	0	584,924	407.7
13	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
14	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
15	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
16	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
17	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
18	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
19	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
20	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
21	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
22	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
23	10,512	12,667	23,179	21,024	0	21,024	14,273	9,144	584,924	407.7
24	10,512	12,667	23,179	21,024		21,024	14,273	9,144	584,924	407.7

Recent water sampling of the dewatering wastewater at the Comet Project (March 2021) and the water contained within the Friars Pit (September 2021) indicates the water quality is similar in quality with the exception of nitrate in the wastewater from the Comet Project which is considerably higher (41 mg/L) than the Friars Pit (2.1 mg/L). See Table 1 below for water quality results.

Table 1: Comet Project and Friars Pit water quality comparison

Sample Id	Units	Comets Project	Friars Pit
Calcium	mg/L	200	170
Magnesium	mg/L	81	150
Sodium	mg/L	720	580
Potassium	mg/L	27	28
Bicarbonate	mg/L	100	170
Sulphate	mg/L	510	610
Chloride	mg/L	1400	1200
Total Dissolved Solids	mg/L	3100	3000
Conductivity	µS/cm	5300	4600

Sample Id	Units	Comets Project	Friars Pit
pH	pH units	8.1	8.3
Carbonate	mg/L	<1	<1
Alkalinity	mg/L	85	140
Acidity	mg/L	<5	<5
Fluoride	mg/L	1.3	0.5
Nitrite	mg/L	0.4	<0.05
Nitrate	mg/L	41	2.1
Silicon	mg/L	15	14
Hardness	mg/L	840	1000
Aluminum	mg/L	0.016	<0.005
Arsenic	mg/L	0.02	<0.001
Cadmium	mg/L	0.0003	<0.0001
Cobalt	mg/L	<0.001	<0.001
Chromium	mg/L	<0.001	0.001
Copper	mg/L	0.002	<0.001
Iron	mg/L	<0.005	<0.005
Manganese	mg/L	0.003	0.002
Nickel	mg/L	0.021	<0.001
Lead	mg/L	<0.001	<0.001
Selenium	mg/L	0.006	0.002
Zinc	mg/L	0.013	<0.005
Molybdenum	mg/L	0.065	0.014
Mercury	mg/L	<0.00005	<0.00005

Receiving dewatering wastewater from the nearby Comet Project will require the inclusion of an Environmental Protection Regulation 1987 Category 61 into the Licence, which is defined as *Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated*, where the production or design capacity exceeds 100 tonnes or more per year.

TSF2 embankment raise

The existing TSF2 was last active in October 2018. The paddock style facility has a current embankment height of 12.2 metres (m) with a crest level of 480 metres reduced level (mRL). The Licence Holder proposes to increase the embankment height by an additional 5m through two 2.5m upstream lifts within the footprint of the TSF2. The final height of the embankment will be level with the adjacent TSF1 (decommissioned). The material required to construct each raise will be sourced from within the TSF2 (historical tailings material) and from the nearby Caustons waste rock dump.

An operational freeboard of 300mm will be maintained from the embankment crest and a freeboard of at least 500mm will be maintained above the supernatant pond, to maintain capacity following a 1 in 100 year 72 hour rainfall event.

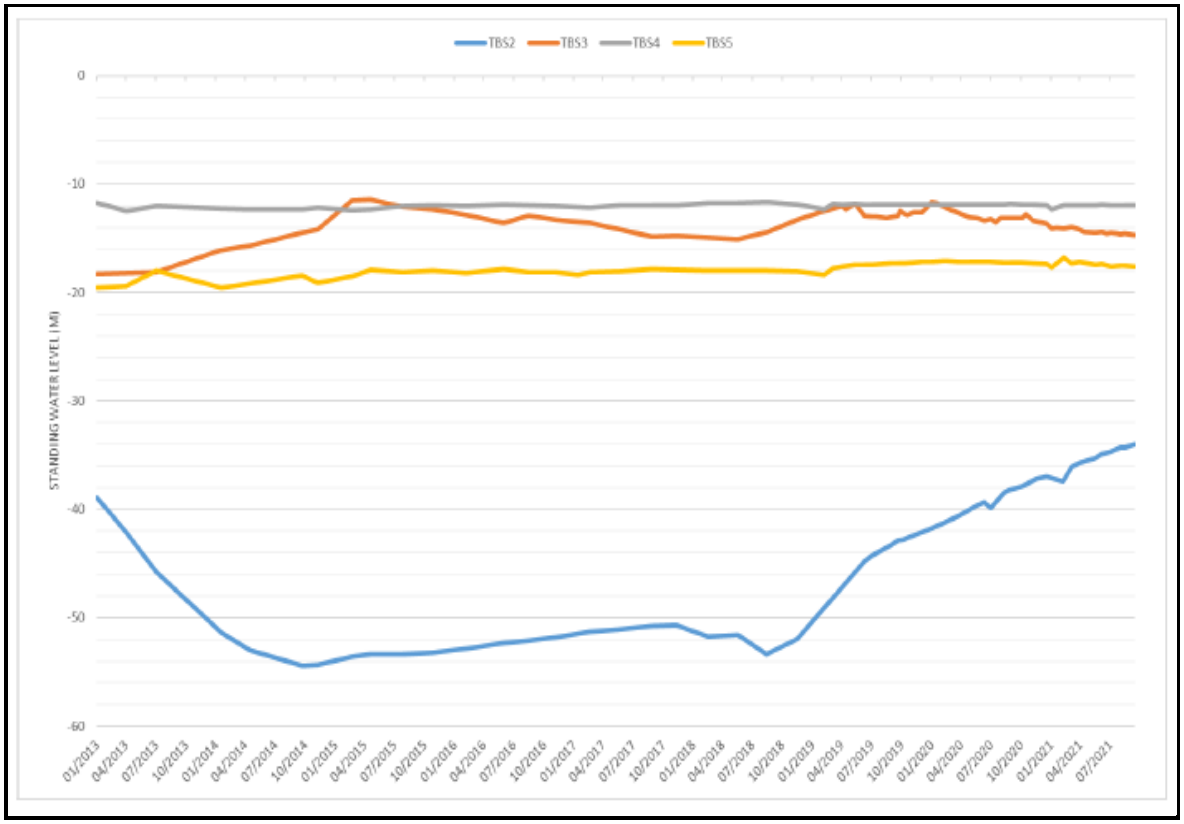
Tailings will be pumped to the TSF2 along an existing tailings pipeline corridor and discharged sub-aerially via multiple spigots located around the perimeter embankment. Water will be collected from the TSF2 by an existing centrally located decant tower before being pumped back to a process water pond for reuse in the Tuckabianna Process Plant. The decant tower will be raised concurrently with each embankment lift.

The TSF2 is located adjacent to an ephemeral creekline which flows in a southerly direction. The TSF2 was constructed in a low-lying area which is susceptible to flooding with evidence of surface water pooling along the northern embankment of the TSF2 following rainfall. A historical break in the toe drain allowed water to flow from the toe drain into the creekline on the western side of TSF2. Rockwater Pty Ltd was contracted by the Licence Holder to complete a surface water assessment to determine peak flood levels and the potential impact of surface water flows against the TSF2 and for an extension to the TSF2. The results of the assessment (April, 2021) determined that a probable maximum flood (PMF) event would result in overtopping of the toe drain bund. Rockwater recommended the perimeter toe drain bund to be raised to at least 470.28 mAHD on the northern boundary of TSF2, and to at least 469.06 mAHD on the western and southern boundaries, to protect the facility against a PMF event.

Ongoing monitoring of groundwater bores at the TSF2 as required by the Licence has shown elevated levels of sulphate and TDS within one of the monitoring bores. As a result, the department decided to impose conditions on the Licence requiring the Licence Holder to undertake a groundwater investigation at the location of the TSF2. The purpose of the investigation was to determine the distance and depth to which groundwater contamination extends from theTSF2. The investigation was undertaken by Applied Scientific Services and Technology (ASST) in 2021. The findings from the investigation are shown below:

- The possible seepage on the northern and western toes of TSF2 can be attributable to thick near-surface clay material only (and therefore not seepage).
- Possible seepage on the southern toe of TSF2 is unlikely to extend as far as140m from the TSF2 southern embankment.
- It is likely that the location of TSF2 was selected because of the presence of clay and its effectiveness as an impermeable barrier for downstream seepage.
- Seepage may be possible in the upper topsoil/gravel layer, however given the standing water level (SWL) remains stable between 11 and 15m below ground level (see figure 3) and within the clay layer, any potential seepage is likely to be confined to the toe drain and the area immediately surrounding

Figure 2: Standing water levels at the TSF2



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 2020).

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

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
Fugitive dust	Generated from the installation of additional dewatering pipelines, construction of the	Air/windborne pathway	Limit activities to minimise dust generation on cleared areas. Delay activities if weather conditions are likely to produce excessive dust.

Emission	Sources	Potential pathways	Proposed controls
	embankment lifts and vehicle movements		Use water truck for dust suppression as required. Visual monitoring for dust during construction and maintenance activities.
Discharge of hydrocarbons	Spills and leaks from construction equipment, machinery and stored hydrocarbons	Direct discharge and overland flow	All chemical and hydrocarbons stored onsite will be placed within bunded areas. A self-contained tank and cowling system is already installed to contain uncontrolled release. An existing pontoon-mounted diesel-powered pump and fuel pod is located at the Friars pit. Diesel fuel lines are housed inside a system so fuel is contained if a leak or spill occurs. Hydrocarbon spill kits are stored in close vicinity to all diesel-powered pumps and generators and refuelling areas.
Discharge of saline water	Seepage from the storage of additional dewatering wastewater at the Friars pit	Seepage through unlined pit walls and floor	Visual inspection of infrastructure including vegetation health near the Friars Pit during each 12 hour shift. Routine monitoring of the discharge wastewater quality. Routine monitoring of the standing water level within the pit to ensure a suitable freeboard is maintained.
	Increased discharge of dewatering wastewater into the Friars pit causing overtopping of the pit wall	Direct discharge and overland flow	Routine inspections to ensure the minimum freeboard is maintained. Extraction of pit water for use in the Tuckabianna Process Plant and for onsite site dust control.
	Pipeline leaks and ruptures from additionally installed dewatering pipelines	Direct discharge and overland flow	Pipeline infrastructure to be placed within a v-drain to limit movement and to capture any spills or releases. The v-drain will be constructed to allow any uncontrolled releases to flow to the discharge location. Daily inspections of pipelines.

Emission	Sources	Potential pathways	Proposed controls
Seepage from tailings	Storage of additional tailings in the TSF2	Increased seepage through soil into groundwater causing degradation of soil and groundwater quality and mounding of the groundwater table which could impact surface water and vegetation.	Ongoing quarterly photographic vegetation monitoring around the TSF2 in accordance with Licence conditions. Routine inspections of the active tailings discharge to confirm that the correct operational procedures are followed, the equipment is functioning, and the expected beach profile is developing. Inspection of the decant tower, decant pump operation, adequacy of safety equipment and supernatant pond water levels and areas. Minimise the supernatant pond by recovering water via the decant tower to the process water pond for use in the Tuckabianna Process Plant. Routine monitoring of the groundwater monitoring bores to determine the standing water levels and potential contamination in accordance with conditions of the Licence. Undertake a technical review and operational audit by a suitably qualified professional on an annual basis. The technical review will assess the performance of TSF2 against the design criteria and assumptions and conditions of the operating licence.
		Direct discharge from overtopping of the TSF2 embankment	An operational freeboard of 300mm will be maintained from the embankment crest and a freeboard of at least 500mm will be maintained above the pond, to maintain capacity following a 1 in 100-year,72-hour rainfall event. Daily inspections to ensure the required freeboard is maintained. Water will be recovered from the decant tower to the process water pond.

Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's 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 2020)).

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

Human receptors	**Distance from prescribed activity**
Yarraquin Homestead	12 km south-east of the Premises **Screened out – distance considered too great to be considered a receptor**
Environmental receptors	**Distance from prescribed activity**
Surface water – minor non-perennial water course	Borders the western edge of the TSF2. The ephemeral creek originates north of the TSF2 and runs immediately to the west of the TSF2 before turning to the south-west. The ephemeral creek intersects a main creek line approximately 2.5 km to the south of the Premises. During heavy rainfall events the main creek discharges into Lake Austin located approximately 5 km south of the Premises.
Surface water – Lake Austin Lake Austin is a significant salt lake system that supports micro-organisms which provide a food source for local and migratory bird species.	Approximately 8 km south of the southern portion of the Premises boundary.
Groundwater Historically flows in a south direction towards Lake Austin. Currently at the Premises the local groundwater flows towards mined-out pits, in particular Caustons pit. Groundwater in this location is utilised for stockwatering and mine processing purposes.	Historical groundwater located 23 metres below ground level (mbgl). Loading and/or seepage from TSF2 has resulted in raised water levels in monitoring bores TBS3 to TBS5 to 12 to 18 mbgl.
Tuckabeena Well Stockwatering well however no intentions for future use by the pastoral station owner.	Approximately 500 m to the south-east of TSF2.
Well G 20-8 Nallan Station plans to use this well for stockwatering in the future.	Located 2 km north of TSF2.
Flora The area surrounding the TSF2 is described as in “Very Good” condition, which is defined as “Low density of cleared drill lines, larger patches of vegetation between infrastructure and evidence of grazing and vegetation trampling by goats” (Maia, 2021). Four Priority species were located in the survey area: *Drummondita miniata* (P3), *Sida picklesiana* (P3), *Acacia speckii* (P4) and *Dodonaea amplisemina* (P4)	*Drummondita miniata* is considered endemic to the Murchison bioregion. One plant was located 200m to the south of TSF2. A *Sida picklesiana* plant was also recorded in the drainage line, 600m south of TSF2. All other records of priority flora are located either 2km north or 2.7km south-west of the TSF2.

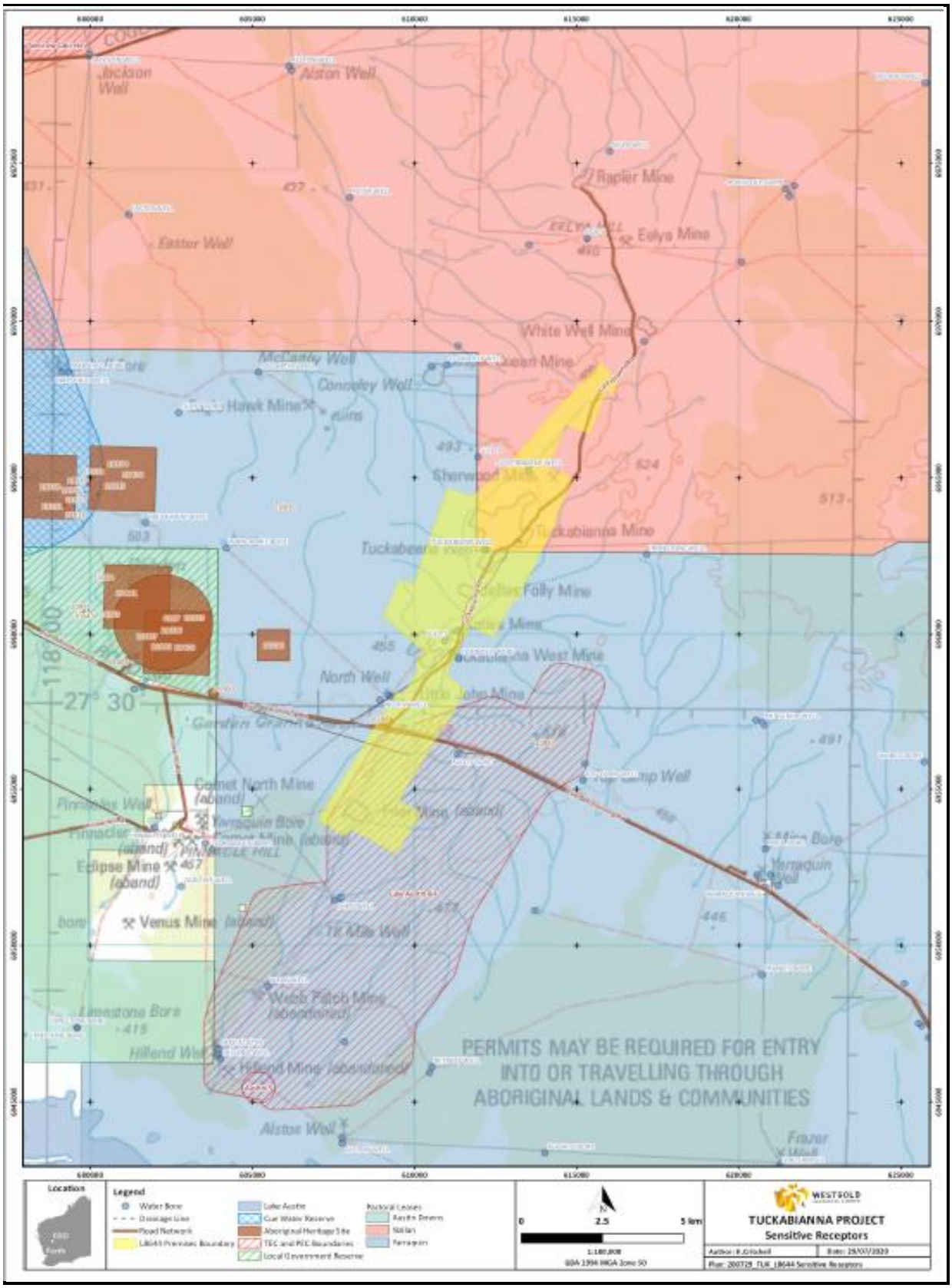


Figure 3: Distance to sensitive receptors

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) 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 incomplete 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 L8644 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 5 and 61 activities.

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 two 2.5 metre embankment lifts at the TSF2 Installation of dewatering discharge pipeline to the Friars Pit	Dust	Air/windborne pathway causing impacts to vegetation health	Priority flora	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	Conditions **8**, 9, 10, 18, 19, 20, 21, 23	Infrastructure to be constructed and located as identified in the submitted application. General provisions of the EP Act apply regarding Environmental Harm.
	Hydrocarbon spills and leaks	Direct discharge and overland flow causing contamination of the surrounding soils and ephemeral creek and reduced vegetation health	Soil Minor non-perennial water course Priority flora	Refer to Section 3.1	C = Minor L = Possible **Medium Risk**	Y	Conditions **8**, 9, 10, 18, 19, 20, 21, 23	Infrastructure to be constructed and located as identified in the submitted application. General provisions of the EP Act apply regarding Environmental Harm. General provisions of the Environmental Protection (*Unauthorised discharges) Regulation 2004*
	Sediment laden stormwater	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Soil Priority flora Minor non-perennial water course	None proposed for construction activities	C = Slight L = Unlikely **Low Risk**	N/A	Conditions **8**, 9, 10, 18, 19, 20, 21, 23	Infrastructure to be constructed and located as identified in the submitted application. General provisions

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**				
								of the EP Act apply regarding Environmental Harm.
Operation								
Dewatering wastewater from the nearby Comet project (L8978) discharged into the Friars pit	Change in the seepage water quality	Seepage through the unlined pit causing contamination of the groundwater, ephemeral creek, surrounding soils and vegetation.	Groundwater Minor non-perennial water course Surrounding soils Priority flora	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	Conditions 1, **2**, **3**, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22 23 and 24	The Friars Pit is already licensed to receive dewatering wastewater generated at the Premises. The dewatering wastewater from the offsite Comet Project is comparable with the water contained within the Friars pit, with the exception of Nitrate. Nitrate concentrations in the wastewater are 41 mg/L (March 2021) compared to 2.1mg/L in the Friars pit (September 2021). However, these levels are still well below the livestock (receptor) drinking water guideline of 700 mg/L. All other elements are below recommended water quality guidelines for stockwatering.

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				
								The minor water course is void of permanent surface water and only flows during large rainfall events. Therefore, eutrophication of surface waters in unlikely to occur. Condition updated identifying the Friars Pit as an emission discharge point for receiving wastewater from the dewatering of pits at the nearby Comet Project (L8978). The Licence Holder has committed to discharging a total of 252,288 tonnes per annual period which has been applied as a condition of the Licence. Existing conditions apply regarding monitoring the quality and quantity of wastewater discharged into the Friars Pit. Existing standard administrative and reporting conditions apply.

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**				
	Discharge of saline dewatering wastewater from overtopping of the Friars pit	Direct discharge causing contamination of surrounding land with saline water affecting soil quality and causing vegetation stress or death. Downstream impacts on surface water due to discharge into the nearby ephemeral creek	Minor non-perennial water course Surrounding soils Priority flora	Refer to Section 3.1	C = Slight L = Rare **Low Risk**	Y	Conditions 1, 2, **3**, 15, 18, 19, 20, 21, 23 and 24	The calculated available capacity of the Friars Pit is expected to be 1,401,159 tonnes when dewatering discharge will commence. The pit water level is expected to be at 407.7mRL. The Friars Pit crest level is 441.3mRL, a difference of 33.6 metres. The Licence Holder states only 252,288 tonnes of wastewater will be discharged into the Friars Pit over a 12-month period. Outflows for use in the process plant and for dust suppression are expected to balance with the discharge amounts and therefore the water volume within the pit is expected to remain unchanged. Condition 3 amended to include as a limit the Licence Holder's commitment to only discharge 252,288 tonnes of wastewater

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				
								annually. Standard authorised emissions, monitoring and reporting conditions are already applied in the Licence.
	Discharge of saline dewatering wastewater due to pipeline leeks and ruptures	Direct discharge causing contamination of surrounding land with saline water affecting soil quality and causing vegetation stress or death. Downstream impacts on surface water due to discharge into the nearby ephemeral creek	Minor non-perennial water course Surrounding soils Priority flora	Refer to Section 3.1	C = Slight L = Possible **Low Risk**	Y	Conditions 1, 4, 5, **6**, **7**, 18, 19, 20, 21, 23 and 24	The transfer of dewatering wastewater through pipelines to the Friars Pit already occurs at the Premises. The quality of the dewatering wastewater from the offsite Comet Project is the same or similar to existing onsite dewatering discharge through pipelines. Any additional dewatering pipelines will be constructed of the same material and installed in accordance with the existing infrastructure. Standard construction, compliance and reporting conditions for the new pipelines have been included in the Licence.

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**				
								Therefore, the Delegated Officer considers there is no change in the risk at the Premises with the transferring of dewatering wastewater from the offsite Comet Project into the Friars Pit through existing and new pipelines.
Increased capacity at the TSF2 for the storage of tailings materials	Tailings from overtopping of the TSF2 embankment	Direct discharge to land causing degradation of ecosystems.	Surrounding soils Priority flora Minor non-perennial water course borders the western edge of the TSF2	Refer to Section 3.1 Refer to Section 3.1	C = Moderate L = Rare **Medium Risk**	Y	Conditions **1**, **3**, 4, 5, **8**, **9, 10**, **16**, 18, 19, 20, 21, 23 and 24	Licence Holder construction commitments included as standard conditions in the Licence. Standard compliance and reporting conditions for the construction of the TSF2 lifts and pipelines have been included in the Licence. Potential emissions and discharges identified from overtopping of the TSF2 embankment and pipeline failure have been risk assessed in regard to conditions in place on the existing Licence.
	Tailings pipeline or return water pipeline leaks/rupture				C = Slight L = Possible **Low Risk**	Y	Conditions 4, 5, **6**, **7**, 18, 19, 20, 21, 23 and 24	

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**				
								The Delegated Officer considers that sufficient regulatory control is present within the existing Licence to mitigate potential emissions.
	Tailings seepage	Increased seepage through the TSF2 embankment causing contamination of the underlying groundwater, downstream impacts on surface water and surrounding vegetation and soils through surface expression.	Groundwater Surrounding soils Priority flora Minor non-perennial water course borders the western edge of the TSF2	Refer to Section 3.1	C = Moderate L = Unlikely **Moderate Risk**	Y	Conditions **1**, **2**, **3**, 4, 5, **8**, **9**, **10**, 11, 12, 13, 14, **16**, 17, 18, 19, 20, 21, 22, 23 and 24	A seepage investigation (ASST, 2021) determined that limited seepage may be possible in the upper topsoil/gravel layer, however given that monitoring shows the SWL remains stable between 11 and 15m (Figure 3) and within the clay layer, any potential seepage is likely to be confined to the toe drain and the area immediately surrounding TSF2. A surface water investigation (Rockwater, 2021) recommended the TSF2 toe drain bunding be increased to protect against potential flooding events. This recommendation has been included as part of the CCI construction conditions.

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				
								The four priority flora species at the Premises are not considered groundwater dependent. A diversion drain is in place to divert stormwater away from the TSF2. Licence Holder construction commitments included as standard conditions in the Licence. Standard compliance and reporting conditions for the construction of the TSF2 lifts have been included in the Licence.

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

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

4. Consultation

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

Table 5: Consultation

Consultation method	Comments received	Department response
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (9/9/2022)	DMIRS replied on 11/10/22 Refer to Appendix 1	Refer to Appendix 1
Licence Holder was provided with draft amendment on 19/9/2022	Comments received 4/10/2022. Refer to Appendix 2	Refer to Appendix 2

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
N/A	Inclusion of Category 61 into Prescribed premises category description table.
N/A	Licence condition numbers updated as required.
1	Inclusion of TSF2 into Table 1 as an approved location for the discharge of tailings.
2	Inclusion of the Friars Pit as an emission discharge point for the discharge of wastewater from the dewatering of mined pits at the Comet Project. Also inclusion of the TSF2 as a discharge point for tailings.
3	Table 3 updated to include discharge limits for the TSF2 and Friars pit.
4	Table 4 updated to include TSF2 as a source of return water to the process water pond.
6	New condition detailing the construction requirements for the dewatering pipelines.
7	New condition requiring the Licence Holder undertake an audit of the constructed dewatering pipelines and then submit an audit report on compliance with the construction requirements.
8	New condition detailing the construction requirements for the TSF2 Stage 1 and 2 embankment raises, decant tower, VWP's and tailings discharge and return pipelines..
9	New condition requiring the Licence Holder undertake an audit of the constructed Critical Containment Infrastructure and then submit a Critical Containment Infrastructure Report on

	compliance with the construction requirements.
10	New condition detailing what as a minimum must be contained within the Critical Containment Infrastructure Report required in condition 9.
16	Table updated to include the requirements for monitoring of volumes of tailings deposited into the TSF2 and volumes of water recovered from the TSF2.
Previous condition 13	The requirement for the Licence Holder to provide Improvement IR1 and IR2 has been removed from the Licence. The requirement to undertake a ground based geophysical investigation and provide a report on the findings has now been provided by the Licence Holder. Note DWER will provide a separate response to the findings in the report.
Definitions	Definition for 'AEP' and TSF2 included.
Schedule 1: Maps	Map of emission points updated to include the TSF2
Schedule 3: Design drawing	New schedule showing construction details for the TSF2 embankment lift for raise 1 and raise 2, decant tower and causeway, and VWP location and details.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Big Bell Gold Operations Pty Ltd, *L8644/2012/1 Licence Amendment Supporting Documentation, Tuckabianna Project*, March 2022
5. Big Bell Gold Operations Pty Ltd, *Cue Gold Operations, Report on Improvement Program Actions IR1 and IR2 (L8644/2012/1)*, October 2021
6. Applied Scientific Services and Technology, *Report for Geophysical Assessment of the TSF 2&3 Sites at the Westgold Tuckabianna Mining Operations Near Cue, WA*, March 2021.
7. Rockwater, 2021. *Surface Water Assessment; Planned TSF3*. Perth: Unpublished report for Westgold Resources Limited.

Appendix 1: DMIRS comments on licence amendment application

Email received from DMIRS Environmental Officer Maree Doyle dated 11 October 2022.

The Mining Proposal for the construction of an embankment raise at the Tuckabianna Tailings Facility 2 is currently under assessment I followed the link in your original letter, but wasn't able to find anything about this application (https://www.der.wa.gov.au/our-work/licences-and-works-approvals/lwa-applications). The MP we have proposes one, 12m lift (upstream raise) to be raised to 485mRL (17-18m final height). The construction material will be Ferricrete foundation, starter bund construction utilising clayey mine waste. Tailings from TSF2 and mine waste from Caustons to be utilised for upstream raising construction. The original design report was by Golder Associates (2015) and confirmed with a contemporary technical review by CMW (2022).

Relevant to your license amendment, DMIRS had requested some clarification of the risk pathways derived from the new deposition of tailings into TSF2.

DMIRS Geotechnical Engineers had also provided the following comments (relating to the TSF2 raise) that I had asked Westgold to address.

- *Given the plan to raise the TSF, has any further investigation been undertaken, or progress made in repairing the lower embankments to ensure the embankments are not impacted as the facility moves into an operational phase?*
- *Confirm the post seismic stability analysis results for TSF2 raise and if there is the potential for liquefaction*
- *Provide details and locations of new vibrating wire piezometers and monitoring bores for TSF2 based on recommendations by consultants.*
- *Provide the previous two third party TSF annual reports when TSF2 was in operation. This is not required to be appended, at this stage, simply required to inform geotechnical review.*
- *Provide the details to address risk of PMP flood events of the TSF2 embankments as per consultant recommendations.*
- *Describe the process Westgold will follow to ensure that the rate of rise for TSF2 will be managed as it currently appears it would be based on some form of administration control*

I'm happy to send through their response, once received.

The only other comment I would have is that there appears to have been very little waste characterisation or sampling of the proposed Comet North Underground ore, previously the Comet North pit has yielded fibrous and potentially acid forming materials. This risk pathway is proposed in the MP to be managed in accordance with the DWER license conditions, and so DMIRS do not require any outcomes or management of seepage. No further information has been requested from Westgold, at this time, but I would be interested to know if DWER have been provided with any more useful information about the tailings quality

DWER makes the following EP Act Part V observations in relation to the comments made by DMIRS:

- The submitted licence amendment application to DWER states the TSF2 has a current embankment height of 12.2 metres (m), with a

crest level of 480 metres reduced level (mRL). The Licence Holder proposes in the application to increase the embankment height by an additional 5m through two 2.5m upstream lifts. This will give a completed embankment height of RL485.0 m which has been included as an additional construction requirement in Licence L8644.

- A copy of the Licence Holders response to DMIRS regarding comments raised by DMIRS Geotechnical Engineers has been provided to DWER.
- DWER considers the current network of TSF2 groundwater monitoring bores, as shown in Licence, are sufficient for monitoring for potential impacts. DWER will continue to review monitoring results presented in the Annual Environmental Reports and require the Licence Holder to undertake actions if required.
- DWER has included conditions in the licence requiring alterations are made to the perimeter toe drain to protect the TSF2 against a Probable Maximum Flood (PMF) event.
- DWER has been advised the potentially acid forming ore materials from the Comet North underground mine is estimated at 5,000 tonnes. This small quantity is approximately less than 0.4 percent of the total throughput at the Premises and therefore DWER considers the change in risk to be negligible.

Appendix 2: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition/Section	Summary of Licence Holder's comment	Department's response
Prescribed premises category description. Inclusion of Category 61 classifying dewatered solution as liquid waste or 'wastewater'.	Westgold intends to use the dewatered solution from Comet in the processing circuit and would like further justification from DWER why Category 61 "Liquid Waste Facility' has been added to the licence. This category is not listed on any of the other Big Bell Gold Operations Pty Ltd licences, for which similar dewatering and discharge activities are also applicable.	Regarding your comment on the addition of Category 61 into the Licence, I provide the following explanation. Westgold is proposing to receive at the Premises up to 500,000 tpa of dewatering wastewater (waste) which will be generated offsite (from the Comet Project L8978/2016/1) and will be stored at the Premises (in the Friars Pit) for future use in the processing plant and for dust suppression. These factors satisfy the description of an Environmental Protection Regulations 1987 category 61 Prescribed Premises requiring a licence (shown below). Category 61 - Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated. 100 tonnes or more per year The reason this category is not included into other Westgold licenced premises which store dewatering wastewater in mined pits, is because the dewatering wastewater is generated at the premises and not from 'other' premises.
Table 3 – Emission Discharge Limits Friars pit – 252,288 tonnes per annum.	The Westgold submission requested a maximum 500,000 tonnes of dewatered solution per annum. Westgold would request the limit is increased to 500,000 tonnes per annum. The identified 252,288 tonnes per annum value the expected value, but not the potential maximum.	Supported. Licence amendment to be updated.
Table 4 – Infrastructure and equipment requirements and Table 6 – Construction of Infrastructure. TSF 2 Freeboard – 500mm	In section 7.2 of the supporting information an operational freeboard (to beach) of 300mm maintained and a 500mm freeboard (to the supernatant) will be maintained. Westgold requests the freeboard figure is updated to 300mm to alight with beach freeboard, common in industry understanding and current operating procedures.	Supported. Definition of the required freeboard updated to clearly describe the required freeboard in accordance with latest standards/guidelines.

Appendix 3: Application validation summary

SECTION 1: APPLICATION SUMMARY					
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:	L8644/2012/1		
		Relevant works approval number:		N/A	☒
Registration	☐	Current works approval number:		None	☐
Date application received		14//04/2022			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Big Bell Gold Operations Pty Ltd			
Premises name		Cue Gold Operations – Tuckabianna Project			
Premises location		Mining Tenements: M20/55, M20/108, M20/111, M20/176, M20/183, M20/195, M20/208 and M20/247, CUE			
Local Government Authority		Shire of Cue			
Application documents					
HPCM file reference number:		2012/002162-1			
Key application documents (additional to application form):		Big Bell Gold Operations Pty Ltd, *L8644/2012/1 Licence Amendment Supporting Documentation*, Tuckabianna Project, March 2022. Big Bell Gold Operations Pty Ltd, Cue Gold Operations, *Report on Improvement Program Actions IR1 and IR2 (L8644/2012/1)*, October 2021.			
Scope of application/assessment					

Summary of proposed activities or changes to existing operations.	Licence amendment - Discharge of dewatering effluent into the Friars mined pit. The source of the dewatering effluent is from dewatering activities at the nearby Comet mine (L8978/2016/1). - Increase the height of the Tailings Storage Facility 2 by an additional 5 metres.

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
Category 5: Processing or beneficiation of metallic or non-metallic ore	1,400,000 tonnes per annual period	No change
Category 6: Mine dewatering	1,700,000 tonnes per annual period	No change
Category 61: Liquid waste facility	500,000 tonnes per annual period	New category
Category 64: Class II putrescible landfill site	500 tonnes per annual period	No change

6.

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	Referral decision No: Managed under Part V Assessed under Part IV
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes No	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes No	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes No	Certificate of title General lease Expiry: Mining lease / tenement Expiry: Other evidence Expiry:
Has the applicant obtained all relevant planning approvals?	Yes No N/A	Approval: Expiry date: If N/A explain why? Mining already an approved activity for this location.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes No	CPS No: N/A No clearing is proposed.

Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes No	Application reference No: N/A Licence/permit No: N/A 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	Application reference No: N/A Licence/permit No: GWL176056(4)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes No	Name: N/A Type: Has Regulatory Services (Water) been consulted? Yes No N/A Regional office: Mid-West Gascoyne
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes No	Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? 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	*Mining Act 1978* *Rights in Irrigation and Water Act 1914* *Dangerous Goods Safety Act 2004*
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes No	
Is the Premises subject to any EPP requirements?	Yes No	
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes No	Classification: N/A Date of classification: N