



Application for Licence Amendment

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

Licence Number	L9155/2018/1
Licence Holder	Avoca Mining Pty Ltd
ACN	108 547 217
File Number	DER2018/001153
Premises	Higginsville Gold Project HIGGINSVILLE, WA, 6443 M15/351, M15/289, M15/225, M15/642, M15/348, M15/31, M15/786, M15/506, M15/507, M15/620, M15/629, M15/639, M15/640, M15/580, M15/581, M15/597, L15/225, L15/288, L15/302, G15/19, G15/23, M15/528, M15/231, M15/748, M15/512, M15/352, M15/610, M15/375, M15/338, M15/1790, M15/1814, L15/282, L15/347, G15/26, G15/27, G15/29, L15/382, L15/389, M15/325, M15/681 and M15/817. As defined by the Premises maps attached to the Revised Licence
Date of Report	26 October 2020
Proposed Decision	Granted

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Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Application summary	1
2.3 Department of Mines, Industry Regulation and Safety	2
2.4 Consolidation of Licence	2
3. Risk assessment	3
3.1 Source-pathways and receptors	3
3.1.1 Emissions and controls	3
3.1.2 Receptors	1
3.2 Risk ratings	3
4. Consultation	8
5. Conclusion	8
5.1 Summary of amendments	9
References	11
Appendix 1: Seepage Issues Associated with TSF 1 - 4	12
Appendix 2: Additional dewatering from Baloo pit to Lake Cowan	16
Appendix 3: Summary of Licence Holder's comments on risk assessment and draft conditions	20
Appendix 4: Application validation summary	22
Table 1 Staged TSF construction	2
Table 2: Licences consolidated in this amendment	3
Table 3: Licence Holder controls	4
Table 4: Sensitive human and environmental receptors and distance from prescribed activity	1
Table 5. Risk assessment of potential emissions and discharges from the Premises during construction and operation	4
Table 6: Consultation	8
Table 7: Summary of licence amendments	9
Table 8: Consolidation of licence conditions in this amendment	10
Table 9 Sediment analysis 2016 and 2020 results (Actis, 2020)	18
Table 10 Diatoms and abundance collected from Lake Cowan (Bennelongia, 2016), no recent data provided	18
Table 11 Aquatic invertebrates and abundance collected from Lake Cowan (Bennelongia, 2016), no recent data provided	18
Table 12 Comparison of licence requirements to reporting by Actis (2020)	19

Figure 1 Location of existing monitoring bores, proposed seepage recovery and proposed compliance monitoring bores (Rockwater, 2020).....	1
Figure 2: Discharge from Baloo pit to Lake Cowan	2
Figure 3 Distance of TSF 2 - 4 from Lake Cowan.....	2
Figure 4 TSF1-4 Monitoring Bores (Rockwater, 2020)	13
Figure 5 TSF 1- 4 monitoring bore standing water level trends (AER 2018-2019)	14
Figure 6 TSFs 1-4 Monitoring Bores WAD CN trends (AER 2018-2019)	14
Figure 8 Bennelongia 2016 sampling locations	17

1. Decision summary

Licence L9155/2018/1 is held by Avoca Mining Pty Ltd for the Higginsville Gold Project (the Premises), located at Higginsville WA.

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 L9155/2018/1 has been granted, subject to conditions and for a limited time frame on some activities only.

The revised licence issued as a result of this amendment consolidates and supersedes the existing licence previously granted in relation to the Premises. The revised licence has been granted in a new format with existing conditions being transferred, but not reassessed, to the new format.

Note that additional dewatering to Lake Cowan has been approved for a period of six months only. The licence holder is required to submit a full set of results as required by condition 3.2.2 (for Lake Cowan) and apply for ongoing approval at that time.

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://www.der.wa.gov.au>.

2.2 Application summary

On 9 June 2020, the Licence Holder submitted an application to the department to amend licence L9155/2018/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The Licence Holder wishes to add several tenements to the prescribed premises boundary and increase dewatering discharge to Lake Cowan from the Baloo pit.

The licence holder also seeks to recommission above ground paddock style tailings storage facility (TSF) cells 2-4, located on M15/348 and G15/19 to allow for an additional 5 years of storage. The TSF was constructed in 1989-1997, with the last tailings being discharged into TSF3 in December 2018. Cell 1 has been partially capped and is no longer accessible. Existing tailings lines and decant water return lines will be used with the applicant indicating only minor changes and tie-ins are required for the tailings pipeline that will be connected to the existing pipeline network that runs from the south of the processing plant.

Additionally Higginsville notified the department on 9 January 2020 that monitoring bore FPMB3 had been destroyed during the course of mining operations and proposed a replacement well (pre-existing well APHMB1) be added during this amendment.

In summary, the following amendments are being sought:

- Additional mining tenements added to the Premises boundary:
 - General Purpose Lease G15/26, G15/27 and G15/29 (associated with TSF2-4 and proposed new monitoring bores and recovery bores);
 - Miscellaneous Licence L15/382, L15/389; and
 - Mining Tenements M15/325, M15/681 and M15/817.
- Construction activities (see Table 1):
 - Initial stage 1 embankment raising of TSF2 by 2.5m to RL1315m for tailings

storage;

- Amalgamation of TSF2, TSF3 and TSF4 into one combined 'super cell' occupying an area of 72ha with a stage height of RL1317.5m to provide storage capacity of 1.95MT.
- TSF2-4 raised by 2.5m to RL1320m for tailings storage; and
- TSF2-4 raised by 2.5m to RL1325.5m for tailings storage (capacity 7.76Mt).
- Commissioning activities: as constructed report to be supplied for all proposed TSF raises on TSF2-4;
- Proposed operations: recommissioning of TSF2, TSF3 and TSF4 to provide an additional 5 years of tailings storage.
- Increase annual dewater discharge to Lake Cowan from Baloo pit to 1,800,000k/L (1,900,000 tonnes) that was assessed in the existing licence for an annual discharge of 1,000,000kL (2,200,000 tonnes). Dewatering of Baloo pit and all dewatering to Lake Cowan will cease by the end of Q2 2021.

Table 1 Staged TSF construction

Stage	TSF	Embankment Raise height (m)	Embankment elevation (RL)	Available volume (m ³)	Available capacity (t)	Storage life @ 1.4Mtpa (Yr)
1	TSF 2	2.5	1315m	478,935	718,400	0.513
2	TSF 2 -4 (merged)	2.5	1317.5m	1,339,065	2,008,600	1.435
3	TSF 2 -4 (merged)	2.5	1320.0m	1,686,755	2,530,130	1.807
4	TSF 2 -4 (merged)	2.5	1325.5m	1,666,574	2,499,860	1.786
TOTAL				5,171,329	7,756,990	5.541

- Replacement of destroyed Vine in-pit monitoring well PFEMB3 with Aphrodite monitoring well APHMB1 500m south west.

2.3 Department of Mines, Industry Regulation and Safety

The applicant has submitted a Mining Proposal to the Department of Mines, Industry Regulation and Safety (DMIRS) under the *Mining Act 1978* for the recommissioning and operation of the TSF. DWER received advice from DMIRS that they had approved a lift to TSF2-4 and advised there were no issues with the proposed TSF design from a structural, geotechnical perspective.

The applicant plans to clear 5.5ha of native vegetation adjacent to TSF1-4, which is below the 10 hectare exemption (clause 2(2) Schedule 1 of the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 for mining tenements. Therefore, no separate clearing approvals are required.

2.4 Consolidation of Licence

As part of this amendment package the department has consolidated the licence by incorporating changes made under the Amendment Notices as summarised in Table 2.

Table 2: Licences consolidated in this amendment

Instrument	Issued	Summary of approval
17/09/2018	L9155/2018/1	New Licence issued
21/12/2018	L9155/2018/1	Amendment Notice 1: to include the Fairplay East Pit as a Tailings Storage Facility, construct a new seepage pond at the TSF and include the current monitoring bores at the Aphrodite in-pit TSF. Add category 64 to the Licence.
14/05/2019	L9155/2018/1	Amendment Notice 2 – Add dewatering from Baloo Pit to Lake Cowan as a discharge and amend the Premises boundary to include the tenement in which Baloo open pit is located.
30/8/2019	L9155/2018/1	Amendment Notice 3 – Include Vine Pit void as a Tailings Storage Facility.
26/10/2020	L9155/2018/1	This amendment

The obligations of the Licence Holder have not changed in consolidating the licence. The department has not undertaken any additional risk assessment of the Premises related to previous Amendment Notices.

In consolidating the licence, the CEO has:

- updated the format and appearance of the licence;
- deleted the redundant AACR form set out in schedule 1 of the previous licence and advised the Licence Holder to obtain the form from the department's website;
- corrected clerical mistakes and unintentional errors.

The full consolidation of licence conditions as they relate to this revised licence are detailed in Section 5.1. Previously issued Amendment Notices will remain on the department's website for future reference and will act as a record of the department's decision making.

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 *Guidance Statement: Risk Assessments* (DER 2017).

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during construction and operation which have been considered in this Amendment Report are detailed in Table 3 below. Table 3 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 3: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction – Tailings Storage Facility embankment lift			
Dust	Earthworks associated with embankment lifts, increased vehicle movements	Air/windborne pathway	Haul roads watered based on scope of work requirements. Operator radio instruction for watering as required.
Noise	Earthworks associated with embankment lifts, increased vehicle movements	Air/windborne pathway	Operating machinery as per manufacturer's specifications including maintenance requirements and the use of mufflers and guards. <i>Environmental Protection (Noise) Regulations 1997</i> apply at all times.
Operation – Tailings Storage Facility			
Dust	TSF embankment erosion	Air/windborne pathway	Compaction of embankments
	Erosion of deposited tailings and generation of dust.	Air/windborne pathway	Rotate slurry spigots around TSF perimeter.
Tailings and contaminated water Historical and on-going seepage issues are described in Appendix 1 - Seepage issues associated with TSFs1-4	TSF2 (prior to amalgamation) And TSF 2-4 (after amalgamation)	Seepage through base and embankments of TSF to soil and groundwater	Proposed controls are listed below in "Applicant Controls – Seepage Management"
Tailings and contaminated water	TSF2 (prior to amalgamation) And TSF 2-4 (after amalgamation)	Overtopping of TSF and direct discharge to land and seepage to soil and groundwater	<ul style="list-style-type: none"> • Operational freeboard to be kept to 300mm minimum; • Beach freeboard of 200mm; • Combined operational and beach freeboard of 500mm. • Cyclic deposition to form sloped beaches. • Embankment downstream slope

Emission	Sources	Potential pathways	Proposed controls
			<p>covered with rock armour to protect from erosion;</p> <ul style="list-style-type: none"> • Embankment compaction to protect from erosion; • Regular checks for signs of erosion, especially after heavy rainfall events or due to tailings deposition. If significant erosion is observed Karora will infill these areas with compacted clay and laterite/crushed rock to stabilise embankments. • Crest sloped inwards to shed water into the TSF. • Check for leaks or fractures of tailings line and return water lines. Any leak or potential failure will initiate an emergency shut down and be immediately reported, followed by initiating containment procedures. • Embankment downstream slope covered with rock armour to protect from erosion.
Contaminated water	Decant water ponds	Seepage from decant water ponds	Existing licence control 1.2.2: ponds lined with at least 0.5m of clay with a permeability of $<10^{-7}$ m/s or equivalent.
		Overtopping of decant ponds and direct discharge to land	Decant water pond kept to a minimum with allowance for a 72hr 1:100-year event.
Operation - Dewatering			
<p>Additional hypersaline (300g/L) mine dewater with elevated soluble metal(oids). pH discharge is slightly acidic (6.0-6.75, Actis 2020, Avoca 2019).</p> <p>Excessive salt loading associated with discharge.</p> <p>Described below in "Additional dewatering from</p>	Dewater from Baloo pit	Direct discharge into Lake Cowan	<p>Dewatering to Lake Cowan from Baloo pit is described further in Appendix 2. No additional controls are proposed by the applicant for dewatering aside from current monitoring conditions on the licence:</p> <ul style="list-style-type: none"> • Existing condition 3.2.1: <ul style="list-style-type: none"> ○ Monitoring conditions placed for pH, TDS, metals, sediment, aquatic biota. • Existing condition 3.2.2: <ul style="list-style-type: none"> ○ Monitoring of aquatic biota.
		Pipeline failure leading to uncontrolled discharge not at the	<ul style="list-style-type: none"> • Pre-existing pipelines to be used, constructed with telemetry leak system and within a bunded corridor. Compliance report submitted to DWER

Emission	Sources	Potential pathways	Proposed controls
Baloo pit to Lake Cowan"		authorised discharge point	<p>2019 confirmed that these pipelines were constructed as required.</p> <ul style="list-style-type: none"> • Existing condition 1.2.5: <ul style="list-style-type: none"> ○ Daily pipeline inspection • Existing condition 3.4.1 <ul style="list-style-type: none"> ○ Monitoring volume discharged – flow metre readings.
Operation –monitoring Vine in-pit TSF (monitoring well replacement)			
Tailings and contaminated water	Vine in-pit TSF	Rising groundwater bringing hypersaline groundwater in contact with vegetation.	<ul style="list-style-type: none"> • Replacement of destroyed monitoring well FPEMB3 with Aphrodite monitoring well APHMB1 (located 500m south west)

Summary of Applicant controls – Seepage Management

See Appendix 1 for a summary of seepage issues associated with TSFs 1- 4. The applicant is proposing the following controls to seepage of contaminated water through base and embankments of the TSF to soil and groundwater:

- Installation of a seepage recovery bore network (Figure 1), drilled at least 10m into fresh rock, 100mm or 155mm slotted PVC and gravel packed. Inclusion of pre-existing monitoring bores into recovery bore network if sufficiently high yielding;
- Water extracted from seepage recovery bores and placed into lined decant water return ponds. Water then pumped into the lined decant water ponds (the small LDPE lined ponds on the south-eastern corner of the TSF) for re-use in the processing plant;
- Use of new compliance monitoring bores HMB6, HMB7, HMB22, HMB25, HMB27, HMB28 (depicted in Figure 1 below) at a greater distance from the TSF (more reflective of risk to vegetation);
- Standing water levels measured for recovery bores and groundwater monitoring bores monthly during active discharge and six monthly when in care and maintenance;
- When water levels are measured to be ≤ 4.5 m bgl for one scheduled monitoring period, a visual assessment will be undertaken to assess vegetation impact. Note that DWER current SWL triggers are 4m bgl (i.e. an additional half metre trigger has been added for the applicant's internal processes);
- When water levels are measured to be ≤ 4.5 m bgl for two consecutive scheduled monitoring periods, a visual assessment will be undertaken to assess vegetation impact and pumping increased in nearby recovery bores if possible;
- When water levels are measured to be ≤ 4.5 m bgl for four consecutive scheduled monitoring periods:
 - Undertake visual assessment in the area to assess whether vegetation has been impacted;
 - Further increase pumping in nearby recovery bores, if possible;
 - Engage hydrogeologist to investigate seepage;

- Liaise with engineers to assess improved methods of tailings disposal and decant recovery;
- Install additional recovery bores, if recommended;
- Notify DWER of course of action and anticipated outcomes.
- A trigger level of 0.4mg/L weak acid dissociable cyanide (WAD CN) to be applied to compliance monitoring bores. WAD CN monitoring undertaken 6 monthly. Note that current DWER WAD CN limits are 0.5 mg/L (i.e. an additional 0.1mg/L trigger has been added for the applicant's internal processes);
- When WAD CN \geq 0.4mg/L for one scheduled monitoring period:
 - Undertake a visual assessment in area to assess whether vegetation has been impacted; and
 - Resample every two months until next scheduled 6 monthly sampling round to ensure analyses are consistent.
- When WAD CN \geq 0.4mg/L for two consecutive scheduled monitoring periods:
 - Undertake visual assessment in area to assess whether vegetation has been impacted;
 - Redevelop bore by air-lifting and resample;
 - Engage hydrogeologist to investigate seepage if lower WAD CN not achieved;
 - Liaise with engineers to assess improved methods of tailings disposal and recovery;
- Notify DWER of course of action and anticipated outcomes.

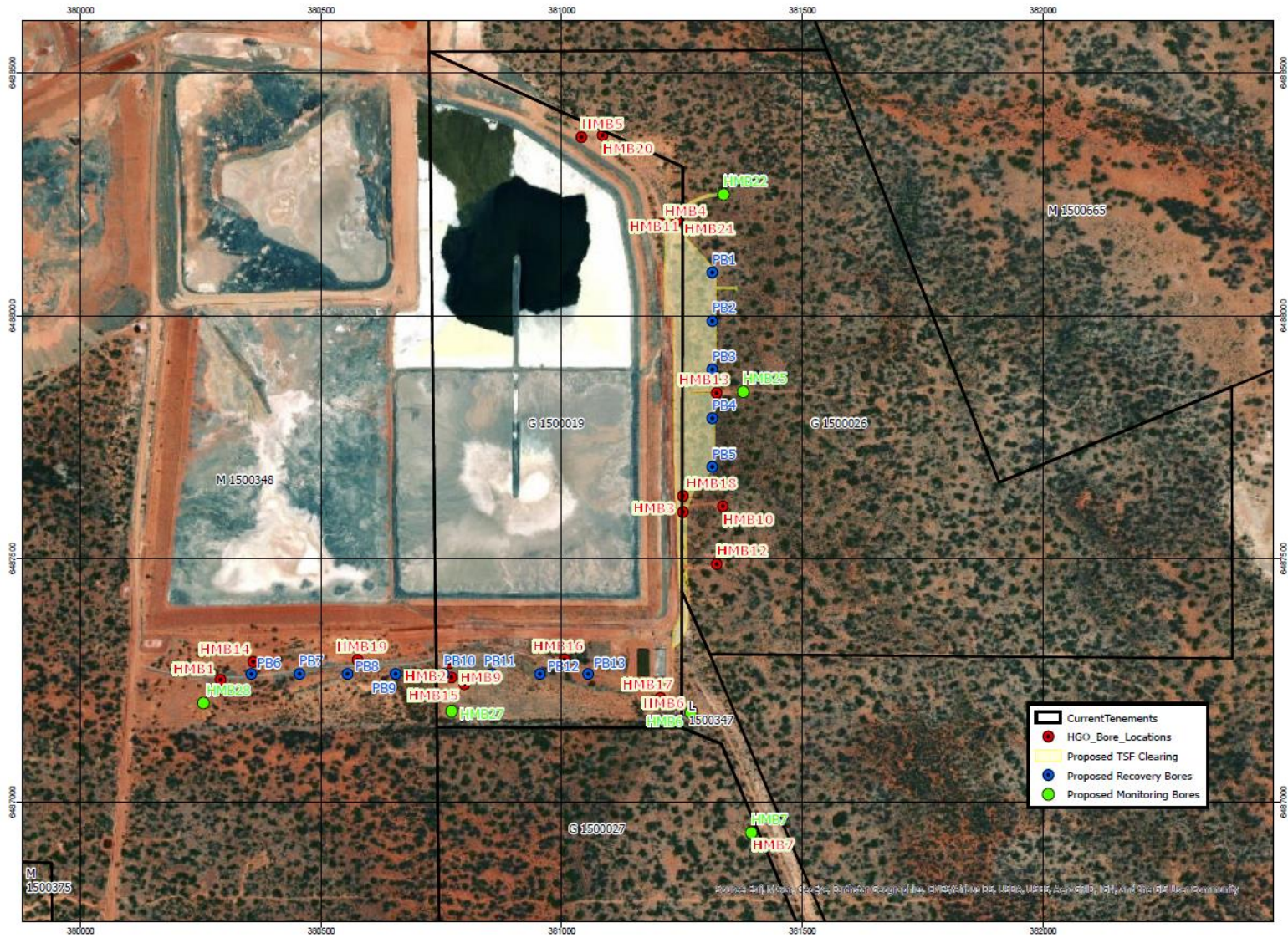


Figure 1 Location of existing monitoring bores, proposed seepage recovery and proposed compliance monitoring bores (Rockwater, 2020)

Licence: L9155/2018/1

3.1.2 Receptors

In accordance with the *Guidance Statement: Risk Assessment* (DER 2017), 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 4 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 (*Guidance Statement: Environmental Siting* (DER 2016)).

The closest human receptors are located within the Widgiemooltha community 30km north west of the Higginsville Operations. Given the significant distance, there is no foreseeable pathway to this receptor and it has therefore not been considered in this risk assessment.

Table 4: Sensitive human and environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Lake Cowan, associated aquatic biota and riparian vegetation (see description below)	<ul style="list-style-type: none"> • Current dewatering of 1,000,000kL/annum directly into Lake Cowan from the Baloo pit (Figure 1) (see Appendix 2 for more detail) • Located 4.5km east (down hydraulic gradient) of TSF2-4 planned for recommissioning during this amendment (Figure 2)
Native vegetation	Directly adjacent to TSF and dewatering infrastructure (pipelines)
Groundwater	<ul style="list-style-type: none"> • Historical data from the Rockwater (2020) report indicates groundwater levels historically originally between approximately 15 and 22m bgl. • The most recent data collected by Rockwater in May 2020 indicates groundwater levels between 0.5 and 10.3m bgl; • All registered groundwater bores within 2km of the prescribed premises boundary are registered for use by Avoca Mining Pty Ltd. There are no other groundwater users within 2km of the prescribed premises boundary. • Groundwater beneath the site is hypersaline, with water quality data from 2008 ranging from 16,000mg/L TDS (HMB2) – 45,000mg/L TDS in HMB5. Groundwater flows east towards Lake Cowan.

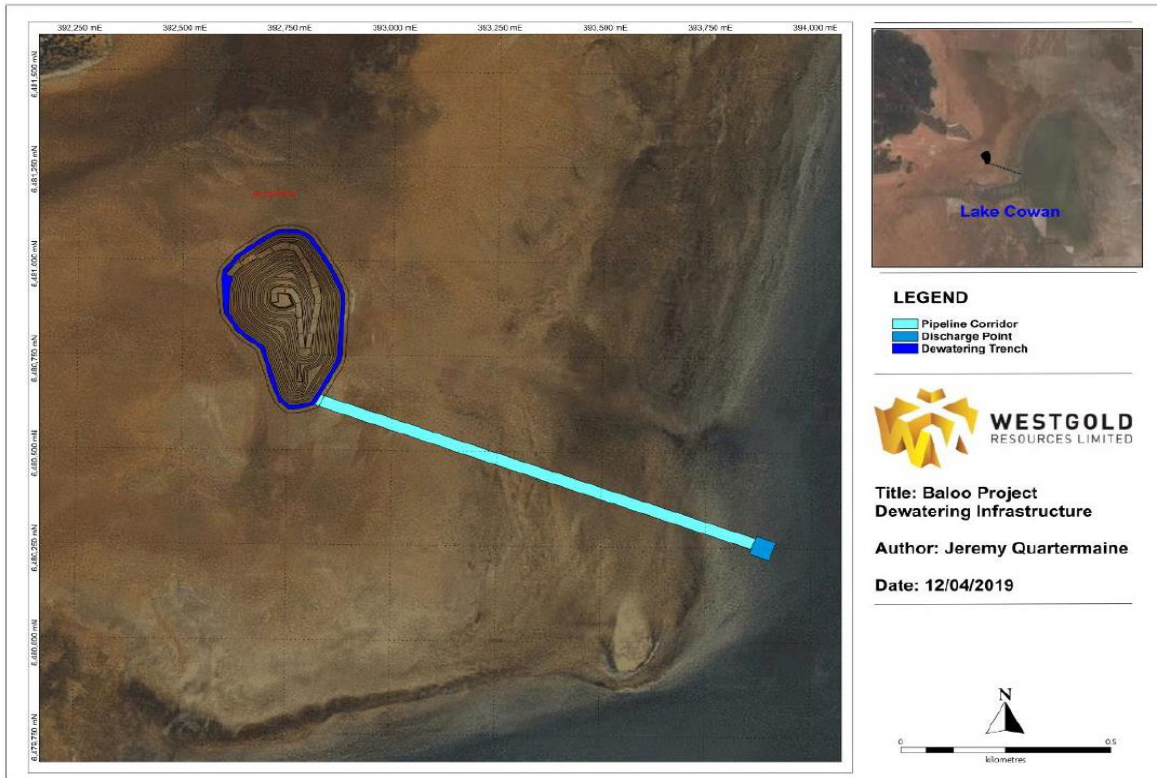


Figure 2: Discharge from Baloo pit to Lake Cowan



Figure 3 Distance of TSF 2 - 4 from Lake Cowan

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

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

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

The Revised Licence L9155/2018/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. category 5 and 6 activities.

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

Table 5. Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls			
Construction							
Earthworks associated with embankment lifts, increased vehicle movements.	Dust	Air/windborne pathway causing impacts to native vegetation	Native vegetation adjacent to works	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	N/A	N/A
Operation (including time-limited-operations operations)							
Recommissioning and operation of TSF 2 (prior to amalgamation) and super cell TSFs 2-4 (post amalgamation)	Tailings and contaminated water	Seepage associated with additional input through base and embankments of TSF to soil and groundwater	Rootzones of native vegetation and Lake Cowan (4.5km east of TSF).	Refer to Section 3.1	C = Moderate L = Likely High Risk	<p>The following modifications to existing conditions and addition of conditions will be placed on the licence as regulatory controls.</p> <p><u>Existing conditions</u></p> <p>1.2.4 (freeboard and seepage)</p> <p><u>Modifications to existing conditions:</u></p> <p>1.2.2 (infrastructure requirements)</p> <p>1.2.3 (freeboard and seepage recovery)</p> <p>3.4.1 (process monitoring)</p> <p>3.5.1 (ambient environmental monitoring)</p> <p><u>New conditions</u></p> <p>1.2.6 (installation of additional groundwater</p>	<p>Historical seepage issues associated with TSFs 1-4 and seepage management report provided by the applicant (Rockwater, 2020) indicate on-going seepage issues are likely upon recommissioning of TSFs 2-4. Additional regulatory controls will therefore be placed on the licence.</p> <p><u>New monitoring bores</u></p> <p>Applicant proposed new monitoring bores are not appropriately screened (HMB 22, 25, 27, 28 are screened from surface to depth). Wells should be appropriately screened and comply with ASTM D5092/D5092M-16 Standard practice for design and installation of groundwater monitoring bores. Consequently, a requirement for installation of a minimum of four additional groundwater monitoring bores (HMB29, 30, 31, 32) to the east and south east of TSF 2-4 has been placed on the licence.</p>

Risk Event					Risk rating ¹ C = consequence L = likelihood	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls			
						<p>monitoring bores and recovery bores)</p> <p>1.2.8 (demonstrating seepage management)</p>	<p>Rockwater's (2020) report also indicates HMB22, 25, 27 and 28 are not constructed appropriately for compliance monitoring.</p> <p>Monitoring wells (HMB1, HMB3, HMB4, HMB5, HMB6, HMB7 and HMB9) will remain on the licence as compliance wells for the purposes of trend analysis. The department may reconsider these wells at a later date, once data is accumulated for the new monitoring well network.</p> <p><u>Seepage management</u></p> <p>As seepage issues are likely to continue upon recommissioning of the TSF (Rockwater, 2020), condition 1.2.8 has been placed on the licence indicating deposition into the TSF may occur for twelve months only and that a report must be submitted to the department 9 months after the date of amendment issue demonstrating that the proposed controls are adequately managing seepage. The licence holder may apply for a new licence amendment for continued deposition into the TSF at this time.</p>
		Overtopping of TSF and direct discharge to land	Native vegetation directly adjacent	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	<p><u>Existing conditions</u></p> <p>1.2.4 (freeboard and seepage)</p> <p><u>Modifications to existing conditions:</u></p> <p>1.2.6 (construction requirements)</p>	<p>To accommodate increased throughput, addition and modification of conditions are required to include embankment lifts, compaction and stipulate freeboard requirements to prevent overtopping and discharge to land.</p>

Risk Event					Risk rating ¹ C = consequence L = likelihood	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls			
						3.4.1 (process monitoring) <u>New conditions</u> 1.2.3 (staged construction) 1.2.9 (requirement for regular checks and corrective action for embankments)	
Additional discharge of mine dewater from Baloo pit	Mine dewater with elevated soluble metal(loid)s. pH of discharge is slightly acidic (6.0 – 6.75) Excessive salt loading associated with discharge.	Direct discharge into Lake Cowan	Lake Cowan aquatic biota (diatoms, invertebrates), water birds. No threatened species recorded in baseline survey conducted in 2016, although survey was limited. Very limited recent data provided by Actis 2020 – insufficient for the department to make a determination.	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	<u>Existing condition:</u> 3.2.1 (Monitoring conditions placed for pH, TDS, metals, sediment, aquatic biota) 3.2.2 (Monitoring of aquatic biota) <u>New conditions</u> 2.2.2 (allowing six months of additional dewatering and requiring monitoring results as per condition 3.2.2)	As the licence holder did not provide a full set of monitoring as required by condition 3.2.2 for Lake Cowan, the department was unable to fully assess the risk associated with additional dewatering. Dewatering will be approved for six months from the date of amendment issue only (and therefore only half the additional quantity requested approved). The requirement for providing a full set of monitoring results as per condition 3.2.2 within 3 months of licence amendment issue has been placed on the licence. The licence holder may apply for a new licence amendment to allow for additional dewatering at this time.
	Mine dewater with elevated soluble metal(loid)s. pH of discharge is slightly acidic (6.0 – 6.75) Excessive	Pipeline failure leading to uncontrolled discharge not at the authorised discharge point	Riparian vegetation Aquatic biota within Lake Cowan	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	<u>Existing conditions</u> 1.2.5: (pipeline inspection) 3.4.1 (flow metre readings)	Pre-existing pipelines to be used, constructed with telemetry leak system and within a bundled corridor. Compliance report submitted to DWER 2019 Existing licence conditions are considered sufficient.

Licence: L9155/2018/1

Risk Event					Risk rating ¹ C = consequence L = likelihood	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls			
	salt loading associated with discharge.						
Tailings deposition into Fairplay East In-pit (monitoring well replacement)	Groundwater mounding from tailings seepage	Rising groundwater brining hypersaline groundwater in contact with vegetation	Adjacent native vegetation	Replacement of destroyed FPEMB3 with APHMB1.	C = Moderate L = Rare Medium Risk	<p><u>Modifications to existing conditions:</u></p> <p>1.2.6 (requirements for monitoring well construction)</p> <p>3.5.1 (groundwater monitoring)</p>	<p>FPEMB3 was placed on the licence as a regulatory control to monitor groundwater mounding associated with the Fairplay East In-Pit TSF in amendment notice 3. Proposed use of APHMB1 for this purpose is considered unsuitable, as APHMB1 is 500m south west of destroyed FPEMB3.</p> <p>Whilst deposition to Fairplay east has ceased, emissions associated with Fairplay east have not. On-going trend analysis is required post deposition and consequently the requirement to replace FEPMB3 placed on the licence.</p> <p>Condition 1.2.6 has been modified to include installation of a replacement monitoring well for FEPMB3 at the original location.</p>

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guidance Statement: Risk Assessments* (DER 2017).

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

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Local Government Authority – Shire of Coolgardie advised of proposal (21 August 2020)	None received	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (21 August 2020)	DMIRS provided advice on 11/9/20 indicating they had recently approved a lift at the Higginsville TSF2-4 and that the mining proposal was reviewed by a geotechnical engineer with no issues with the proposed TSF design from a geotechnical perspective.	N/A
Licence Holder was provided with draft amendment on 30 September 2020	Refer to Appendix 3	Refer to Appendix 3

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.

After conducting a risk assessment (see section 3 of this report), DWER finds that the risk of continued seepage associated with operation of TSF2-4 remains high. Condition 1.2.8 has been placed on the licence indicating the licence holder may deposit tailings into TSF2-4 (pre and post amalgamation) for twelve months only and must provide a report to the department indicating the proposed controls are adequately managing seepage nine months after the date of licence amendment issue. The licence holder may apply for a new licence amendment for continued deposition into TSF2-4 at this time.

Additionally, the construction of the applicant proposed new monitoring bores is insufficient for their addition to the licence as compliance monitoring bores. Consequently a requirement for installation of a minimum of four additional groundwater monitoring bores to the east and south east of TSF2-4 (HMB29, 30, 31, 32) has been placed on the licence (condition 1.2.6). Monitoring wells (HMB1, HMB3, HMB4, HMB5, HMB6, HMB7 and HMB9) will remain on the licence as compliance bores for the purposes of trend analysis. The department may reconsider these wells later, once data is accumulated for the new monitoring well network.

Data provided by Actis (2020) with respect to Lake Cowan is limited with respect to aquatic biota and did not meet requirements of licence conditions 3.2.2. Consequently, the department is limited in its ability to assess impacts of dewatering currently approved and therefore the impact of additional dewatering proposed. Therefore, this activity has only been partially approved under this assessment to allow dewatering for six months for half of the additional quantity applied for in this amendment. A full set of monitoring results as required by condition 3.2.2 are to be submitted to the department within six months after this licence amendment

has been issued. This requirement has been placed on the licence as condition 2.2.2. See Table 12 below for a comparison of Actis results to the licence conditions. The licence holder may apply for a new licence amendment for the remaining quantity required for dewatering after results required by condition 3.2.2 have been provided.

5.1 Summary of amendments

Table 7 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. A summary of licence amendments implemented as part of the amalgamation of amendment notices is included in Table 8. Note where a condition has only been modified to update text from “Licensee” to “Licence Holder”, they are not listed within the amendments described in Tables 7 and 8.

Table 7: Summary of licence amendments

Condition no.	Proposed amendments
N/A	Premises description updated to reflect this amendment
1.2.2	Updated to include reference to TSF2 (prior to amalgamation) and TSF2-4 (post amalgamation). Additional column added for infrastructure location
1.2.3	Additional condition to include staged construction and embankment lifts for TSF 2 and TSF2-4
Former conditions 1.2.3 – 1.2.6	Condition numbers amended to 1.2.4 – 1.2.7. Table references within conditions updated.
1.2.5	Table number updated to 1.2.5
1.2.6	Removal of reference to “Tailings discharge and return water pipelines to and from Vine In-pit TSF” and “Groundwater monitoring bores -VMB1, 2 and 3” – compliance documentation submitted to DWER on 30 December 2019 and found compliant. Addition of TSF2 and TSF2-4 construction requirements Addition of requirement to install monitoring bores, recovery wells and replacement well for FPEMB3. Addition of monitoring well and recovery bore construction requirements.
1.2.8	Additional condition approving TSF deposition
1.2.9	Additional condition to monitor embankment erosion and undertaken corrective action
2.2.2	Requirement to submit results for conditions 3.2.1 and 3.2.2 before a decision will be made on additional dewatering.
2.4.2	Spot sample for emission point listed as quarterly as per compliance inspection recommendation. As per discussion with DWER compliance and enforcement officer after inspection on 22 October 2019 quarterly sampling of spot samples (to provide an average) will be implemented within this condition moving forward. Previous ownership practices would be taken until it met compliant levels, which is not the intention of the licence condition.
3.2.2	Modified to specify monitoring locations MBS112 and MBS113 to remove ambiguity
3.4.1	Addition of TSF2 and TSF2-4 to process monitoring table
3.5.1	Reference to “Above ground TSF” altered to directly reference TSF2-4. Inclusion of additional compliance bores.

	Inclusion of replacement well FPEMB3 for monitoring.
4.2.1	Text modified to reference Table 3.2.1 and tabular format specified for results
4.2.3	Modified to include construction reporting requirements for recovery bores. Table reference update.
4.3.2	Table reference update

Table 8: Consolidation of licence conditions in this amendment

Existing condition	Condition summary	Revised licence condition	Conversion notes
N/A	Premises details updated to include new mining tenements	N/A	Additional tenements added in AN3.
N/A	Prescribed Premises Category table	N/A	Revised to current licensing format. Category 64 added as per AN1.
N/A	Licence requirements text updated	N/A	Updated references to Licensee to Licence Holder and updated hyperlinks.
N/A	Premises description updated	N/A	N/A
1.1.1 1.1.2	Interpretation and definitions	Definitions updated	Revised to include updated definitions and department address.
1.2.2	Discharge to containment infrastructure	Infrastructure updated	Updated as per amendments to include Fairplay East and Vine In-Pit TSF.
1.2.6	Construction requirements text amendment	Text update	Texted amended to reflect table format update
1.2.7	Departures from construction requirements	N/A	Condition added as part of amendment notice 1.
2.2.1	Point source emissions to surface water	Table update	Updated to include Baloo pit point source emissions to Lake Cowan as per amendment notice 2
3.2.1	Monitoring point source emissions to surface water	Table update	Updated to included Baloo pit and Lake Cowan monitoring as per amendment notice 2
3.2.2	Monitoring of aquatic biota	N/A	Condition added in amendment notice 2
3.3.1	Monitoring if emissions to land	Table update	Updated to include bicarbonate, carbonate and sulfate. Removal of tin and titanium. Modified as part of amendment notice 1.
3.4.1	Process monitoring	Table update	Updated in amendment notices 1, 2 and 3 to include new in-pit TSFs and monitoring of Baloo pit.

Existing condition	Condition summary	Revised licence condition	Conversion notes
3.5.1	Groundwater monitoring	Table update	Revised to include new monitoring bores and analytes as per amendments 1, 2 and 3.
4.2.1	Annual Environment Report	Table update	Revised licence condition numbers and reporting for Table 3.5.1
4.2.3	Construction compliance documentation	N/A	Added as part of amendment notice 1.

References

1. Avoca Mining Pty Ltd 2020, application and supporting documentation: DER2018/001153~4
2. Avoca Mining Pty Ltd 2020, Response to request for further information, DWER reference: DWERDT310422 (21/7/20), DWERDT310425 (22/7/20), A1924199 (17/8/20), A1933320 (13/8/20)
3. Bennelongia 2016, Salt Lake Ecology Survey, DWER reference: A1722109
4. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
5. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
6. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
7. DWER 2020, Request for further information, DWER reference: A1913058

Appendix 1: Seepage Issues Associated with TSF 1 - 4

A history of seepage (and on-going groundwater mounding) exists for tailings storage facilities (TSF) 1-4. As part of the application for recommissioning the TSF's, Rockwater (2020) has recently revised the Groundwater Recovery and Seepage management plan originally produced by Coffey in 2017. The Rockwater report indicates that as a result of seepage from the TSF, water levels have been rising in the area since 2009, whereby increased TDS concentrations, weak acid dissociable cyanide (WAD CN) and decreasing pH have been observed in several monitoring bores. Shallow water levels alongside the facility have led to localised vegetation degradation along the immediate eastern boundary of TSF3 and TSF4. The report indicates that several monitoring bores have been pumped and a deep drain has been constructed to recover seepage around the TSF (Figure 4) but that these measures have not been sufficient to control groundwater mounding. This was attributed to low permeability of the weathered bedrock at the TSF and the shallow depth of the drains and bores limiting the depth and radial extent of the drawdown.

Monitoring results for the 2018-2019 Annual Environmental Report (AER) provided under the current licence conditions, demonstrates groundwater mounding surrounding TSF1-4, whereby monitoring bores HBM3, HBM4 and HBM9 (Figure 4) breached the licence limit (groundwater to remain >4m bgl) on four instances in 2018 (Figure 5). Rockwater (2020) also indicated that HMB2, 13-16, 18, 19, 23, 24, 26 and 27 (which are not currently DWER compliance bores), had water levels shallower than the DWER trigger level of 4m bg when measured in May 2020. HMB26 was measured with the shallowest standing water level of 1.2mbgl.

Water levels have been shown to rise substantially since 2008, including HMB7, the furthest bore monitored, located 450m south east of the TSF where water levels have risen by 10m. Rockwater (2020) indicates that seepage is greatest along the southern margin of the TSF where a groundwater mound has developed, centering on bore HMB9 (which has since been pumped) and along the eastern side of the TSF, centred on bore HMB23. Water level rise closely correlates with proximity to the closest active cell.

Pumping from bores HMB3, 4 and 9 resulted in low drawdown. Rockwater therefore indicated that either a large number of closely spaced, low-yielding recovery bores; or a lower number of widely spaced, high-yielding recovery bores is required to control the groundwater mounds. These have yet to be installed and are proposed for seepage management for continued use of TSF2-4. The use of monitoring bores as recovery bores was flagged as an issue for data accuracy during a compliance inspection by DWER on 22 August 2019.

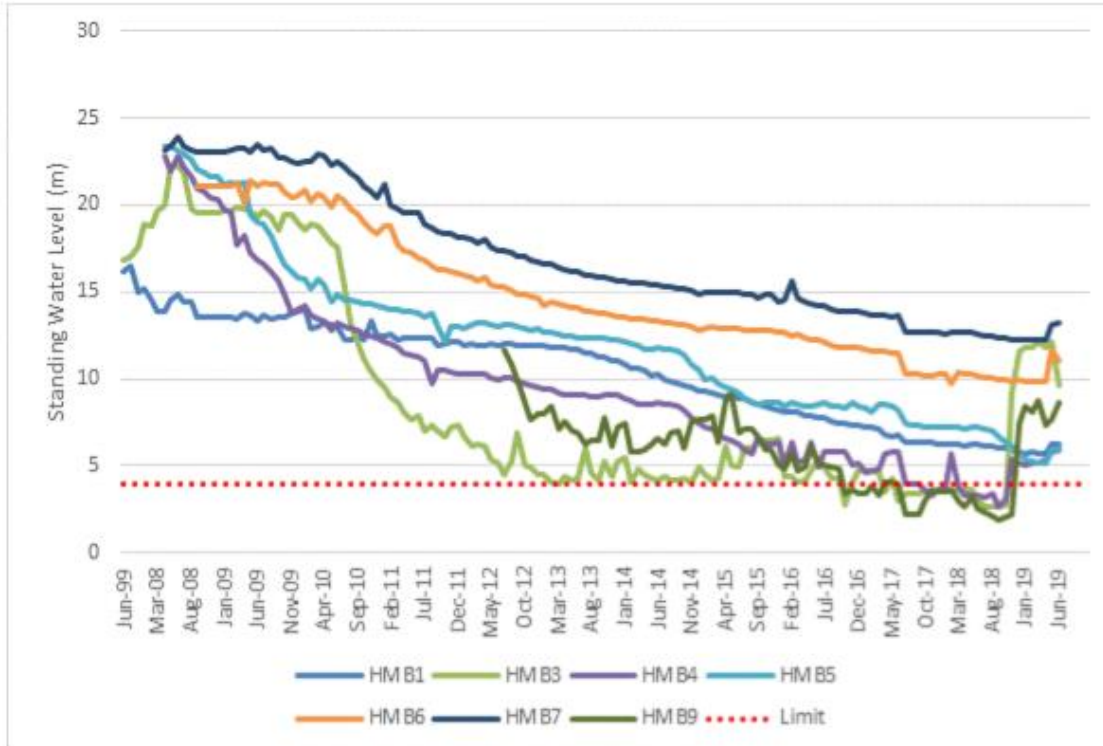


Figure 5 TSF 1- 4 monitoring bore standing water level trends (AER 2018-2019)

Historical data presented in the 2018-2019 AER indicate that HMB3 and HMB9 have also previously exceeded weak acid dissociable cyanide licence (WAD CN) limits (licence condition 3.5.1 – WAD CN limit of 0.5mg/L) (Figure 3). The highest level reported was for HMB3 which returned 2.2mg/L in 2017. HMB2, which collapsed and was replaced by HMB9 (as a compliance bore) in amendment notice 1 (issued January 2019), has also historically exceeded the licence limit for WAD CN (Rockwater, 2020).

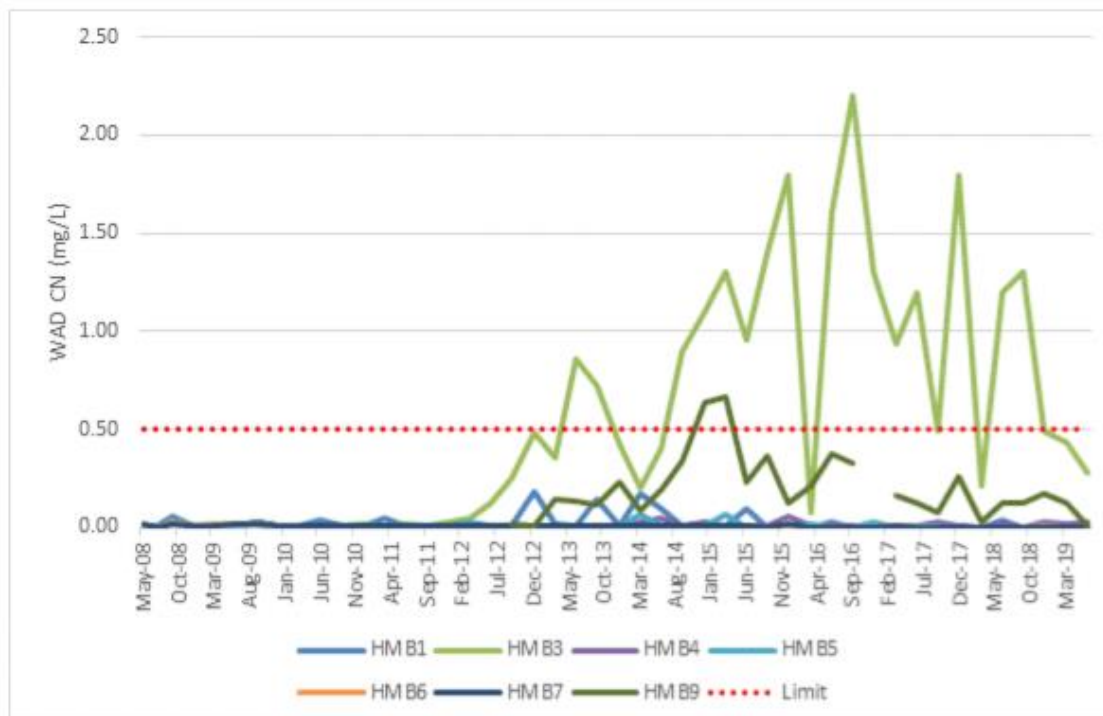


Figure 6 TSFs 1-4 Monitoring Bores WAD CN trends (AER 2018-2019)

As previously described, Rockwater (2020) indicates that seepage is managed (unsuccessfully) by pumping several monitoring bores and use of a drain which runs along the southern and eastern boundary of TSF4, with a decant wall located at the south-east of the cell, from which water is pumped to the seepage recovery dam (Figure 4). Rockwater has suggested seepage management by installing a series of recovery bores, drilled at least 10m into fresh bedrock and lined with 100mm or 155mm slotted PVC, gravel packed and developed. Where existing monitoring bores are sufficiently high yielding they may be included in the seepage recovery bore network. The exact location, number and spacing of the recovery bores are proposed to be determined during drilling, however preliminary modelling by Rockwater suggests a bore spacing of 100m. Proposed seepage recovery and compliance monitoring bores are presented in Figure 4 below. Water extracted from the bores will be discharged to the lined decant water return ponds at the south-eastern corner of TSF4 for re-use within the process plant.

Rockwater suggests that bores HMB6, 7, 22, 27 and 28 should be used for compliance monitoring and that some modifications to bores may be required to make them comply to industry standard guidelines. In addition to these, the applicant has also proposed that HMB 25 be used for compliance monitoring.

The licence holder has indicated that failure of water recovery by the TSF 4 decant tower was due to mis-management by previous facility operators by not following the TSF operating manual, whereby excess water was ponding on the perimeter of TSF2 and TS4. When queried on seepage management the applicant responded that “The TSF4 decant tower will not be used again in the future. The design of the facility for the TSF2-4 supercell has moved the location of the decant tower to a central location. The comparatively large area of the TSF2-4 supercell (compared to TSF 4) has moved the decant [tower] further away from the eastern and southern embankments to further limit the amount of seepage from the facility.”

DWER outcome

After conducting a risk assessment (see section 3 of this report), DWER finds that the risk of continued seepage associated with operation of TSF2-4 remains high. Condition 1.2.8 has been placed on the licence indicating the licence holder may deposit tailings into TSF2-4 (pre and post amalgamation) for twelve months only and must provide a report to the department indicating the proposed controls are adequately managing seepage nine months after the date of licence amendment issue. The licence holder may apply for a new licence amendment for continued use of TSF2-4 at this time.

Additionally, the construction of the applicant proposed new monitoring bores (HMB22 – 28) is insufficient for their addition to the licence as compliance monitoring bores. Consequently a requirement for installation of a minimum of four additional groundwater monitoring bores to the east and south east of TSF2-4 (HMB29, 30, 31, 32) has been placed on the licence (condition 1.2.6). Monitoring wells (HMB1, HMB3, HMB4, HMB5, HMB6, HMB7 and HMB9) will remain on the licence as compliance bores for the purposes of trend analysis. The department may reconsider these wells later once data has been accumulated for the new monitoring well network.

Appendix 2: Additional dewatering from Baloo pit to Lake Cowan

Lake Cowan

Lake Cowan is a large salt lake with an area of approximately 1 145km². Surface water quality in the lake is hypersaline, with a total dissolved solids concentration of approximately 180 000 mg/L to 320 000 mg/L. The inundation pattern of salt lakes in the Goldfields region has been described as episodic, with lakes filled by sporadic non-seasonal rainfall events. The salt lakes have fringing vegetation dependent on intermittent wetting, where evaporation and seepage far exceed rainfall and runoff. Groundwater interactions are not thought to be prominent processes in the ecology of these lakes (Bennelongia 2016).

Salt lakes may provide habitat for aquatic biota that provides a food source for birds and other visiting wildlife. Inundation cycles provide the mechanism for activating dormant biota present in the lake crust and sediments with the degree of the biota diversity and abundance is related to the salinity of the sediments and surface water.

Dewatering to Lake Cowan

Dewatering operations from the Baloo Pit to Lake Cowan were granted under amendment notice 2 on 16 May 2019. Prior to commencement of dewatering, Bennelongia (2016) surveyed the site within the area of the Baloo project and three additional sites within Lake Cowan for sediments, water quality, and aquatic biota. The location of sampling sites is as shown in Figure 8. Sediment, biota and invertebrate analysis are shown in Tables 9, 10 and 11 respectively.

Actis (2020) prepared a report for this amendment requesting additional discharge from the Baloo pit to Lake Cowan. Limited sediment sampling and biota sampling were provided to the department within the report. Two sediment samples collected by Actis in May 2020 indicate elevated levels of copper, nickel, lead and zinc compared to four samples collected by Bennelongia in 2016 (Table 9), however data points and sampling are limited and may not be reflective of overall sediment chemistry.

Reporting by Actis 2020 on aquatic invertebrate fauna and flora is limited. Condition 3.2.1 of the existing licence requires sampling of diatoms and macrophytes. The report speaks mostly of Bennelongia results in 2016 and the only mention of sampling in 2020 is that “amphora sp, Navicula sp and Nitzschia frustules were found during sampling in 2020”. No results from the diatom surface scrapes which were collected were provided with the report.

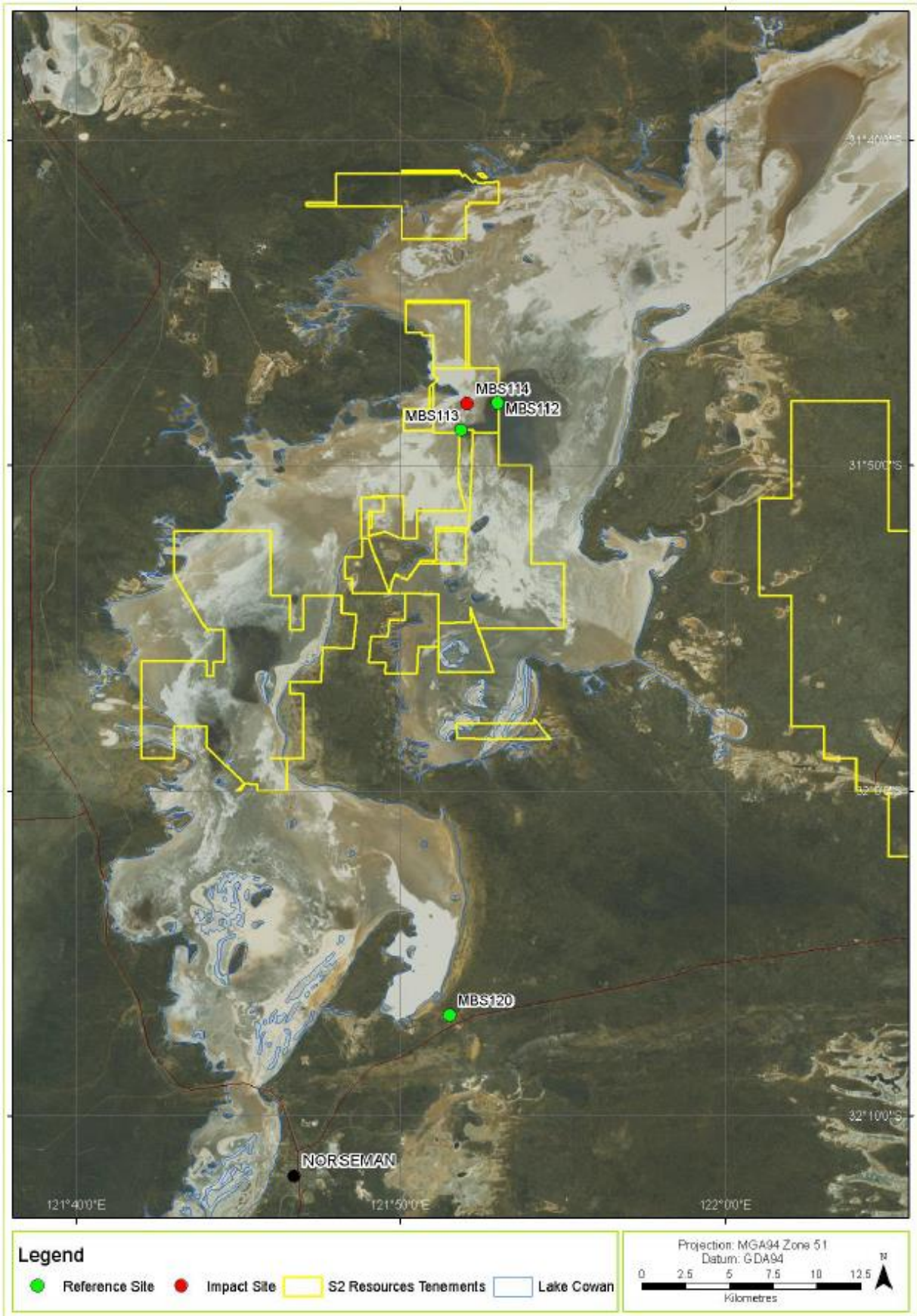


Figure 8 Bennelongia 2016 sampling locations

Table 9 Sediment analysis 2016 and 2020 results (Actis, 2020)

Element	Detection Limit	Unit	MBS112	MBS113	MBS114	MBS120	MBS113 (Actis272)	MBS114 (Actis267)
Year			2016	2016	2016	2016	2020	2020
As	0.2	mg/kg	5.6	2.9	5.1	1	5.8	5.3
Cd	0.05	mg/kg	0.09	0.07	<0.05	0.06	<0.02	<0.02
Cr	0.05	mg/kg	64	140	140	32	150	140
Cu	0.5	mg/kg	4.6	6	6.8	4.4	16	15
Hg	0.02	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Ni	0.1	mg/kg	25	28	32	9.9	53	41
Pb	0.5	mg/kg	2.7	2.9	1.9	1.6	6.3	5.8
Zn	0.25	mg/kg	13	9	8.1	4.8	23	17

Table 10 Diatoms and abundance collected from Lake Cowan (Bennelongia, 2016), no recent data provided

Taxa	MBS112	MBS113	MBS114	MBS120	Total
<i>Amphora coffeaeformis</i>	72	38	8	7	125
<i>Amphora micrometra</i>	7	5		13	25
<i>Entomoneis alata</i>	32	4			36
<i>Navicula cincta</i>				7	7
<i>Navicula cincta var minuta</i>	1				1
<i>Navicula aff duerrenbergiana</i>	12	5		7	24
<i>Navicula aff salinicola</i>	55	147	156	8	366
<i>Navicula sp. 1</i>	13	2			15
<i>Navicula sp. 2</i>				1	1
<i>Nitzschia aff pellucida</i>	9	2	34		45
<i>Nitzschia pusilla</i>			2		2
<i>Proshkinia bulnheimii</i>		2	2		4
Number of taxa	8	8	5	6	11T
Total Abundance	201	205	202	43	651

Table 11 Aquatic invertebrates and abundance collected from Lake Cowan (Bennelongia, 2016), no recent data provided

Higher Group	Family	Species	Sites	No. collected
Nematoda	-	Nematoda sp.	112, 113	30
Crustacea				
Anostraca	Branchiopodidae	<i>Parartemia serventyi</i>	112, 113, 114, 120	185
Copepoda	Cyclopidae	<i>Meridiocyclops platypus</i>	120	12
Ostracoda	Cyprididae	<i>Diacypis whitei</i>	112, 113, 114, 120	77
	-	Ostracoda sp. unident.	112	1
Insect				
Diptera	Muscidae	Muscidae sp.	112, 113, 114, 120	36
	Chironomidae	<i>Tanytarsus barbatarsis</i>	120	1

Baloo pit discharge water quality

Baloo pit water sampling from Actis (2020) and Avoca (2019) indicate that discharge is slightly

acidic and ranges from approximately 6 - 6.75. From limited samples taken, Actis indicates the ionic composition is similar to the standard composition of saturated seawater. Results from both Actis and Avoca indicate elevated levels of strontium at 9.2 parts per million (ppm) where standard seawater composition was indicated by Actis to be approximately 8ppm.

Actis suggests likely impacts to Lake Cowan from additional discharge will include expansion of the wet area of the evaporative basin and suggested that due to the large surface area and high rates of evaporation, impact on the normal hydroperiod of the lake would be minimal. Surface salt loads will be increased to the lake, whereby currently the discharge includes 300,000 tonnes of solids per annum and this will be increased to 600,000 tonnes of solids per annum. Limited detail is given on the effects of additional salt loading on the lake.

Actis collected three samples from the superficial brines of Lake Cowan in May 2020, near the discharge point; pH ranged from 6.30 - 6.75, slightly more acidic than four samples collected prior to discharge in 2016 which ranged from 7 – 8.4. Discharge appears to be lowering the pH of surficial brines. Actis (2020) argues that this drop in pH will not mobilise metals into the brine.

DWER outcome

Data provided by the Actis (2020) with respect to Lake Cowan is limited with respect to aquatic biota and did not meet requirements of licence conditions 3.2.2. Consequently, the department is limited in its ability to assess impacts of dewatering currently approved and therefore the impact of additional dewatering proposed. Therefore, this activity has only been partially approved under this assessment to allow dewatering for six months for half of the additional quantity applied for in this amendment.

A full set of monitoring results as required by condition 3.2.2 are to be submitted to the department within six months after this licence amendment has been issued. This requirement has been placed on the licence as condition 2.2.2. See Table 12 below for a comparison of Actis results to the licence conditions. The licence holder may apply for a new licence amendment for the remaining quantity required for dewatering after results required by condition 3.2.2 have been provided.

Table 12 Comparison of licence requirements to reporting by Actis (2020)

Licence: Lake Cowan monitoring sites (MBS112 and MBS113)		Provided in Actis 2020 report
Condition 3.2.1	Monitoring requirements	
Diatoms	annually during active discharge	Section 4, page 11 "surface scrapes were taken for diatoms. No invertebrates such as crustacea were seen"
Macrophytes		Results indicate "several resampled in 2020 and Amphore sp, Navicula sp and Nitzchia frustule found in 2020 but it could not be determined if the plants were active"
Aquatic invertebrates		Results from diatom sampling were not given. Only above text.
Condition 3.2.2		
Monitoring of aquatic biota (algae [diatoms], macrophytes, invertebrates (including resting stages)) shall be undertaken by a qualified scientist experienced in biological sampling from salt lakes. The ecological components monitored will reflect the lake conditions at the time of sampling (i.e. whether wet or dry). If sampled during dry conditions, hatching of dormant species must be completed to provide a complete record of all species present.		Section 4, page 11 "surface scrapes were taken for diatoms. No invertebrates such as crustacea were seen"
		Results indicate "several resampled in 2020 and Amphore sp, Navicula sp and Nitzchia frustule found in 2020 but it could not be determined if the plants were active"
		Results from diatom sampling were not given. Only above text.

Appendix 3: Summary of Licence Holder's comments on risk assessment and draft conditions

Licence Condition	Summary of Licence Holder's comment	Department's response
Assessed production design capacity	Request to update 1,900,000 tonnes per year to 4,100,000 tonnes per year.	Dewatering has been granted for six months and only half of the additional throughput has been granted to reflect this. See section 3.2 for further information.
1.2.2	Query as to whether discharge points G1 (Aphrodite pit) and G2 (Poseidon North Pit) should also be included within this condition	Condition 1.2.2 has been updated to reference G1 and G2. These are also referenced within emissions to groundwater.
1.2.4(c)	Update to 1.2.4 to remove reference of recovered seepage return to the TSF.	Condition 1.2.4(c) modified to remove return of seepage to the TSF – return to process allowed only
1.2.6 (Table 1.2.6)	Modification of condition: "Installation of a minimum twelve ten recovery bores to the east and south of TSFs 2-4, with demonstrated high sufficient or suitable recovery yields by a suitable qualified hydrogeologist."	Condition 1.2.6 (Table 1.2.6) modified to reflect a minimum of ten bores and wording changed from "high" to "sufficient".
1.2.6 (Table 1.2.6)	Request to remove the requirement for replacement of destroyed monitoring bore FPEMB3 as deposition to Fairplay In-Pit TSF has ceased.	Whilst deposition to Fairplay In-Pit TSF has ceased, emissions from this pit have not. On-going monitoring to determine trends post deposition are required. The requirement to replace FPEMB3 will remain on the licence.
1.2.8	Applicant querying inclusion now that control has been modified for return of recovery water to process (as opposed to original proposed control for return to TSF).	Seepage issues are likely to be on-going with deposition into TSF2-4. The department has modified the condition slightly but as the risk remains high (see section 3.2), deposition will be allowed to the TSF for twelve months only, with a report required to demonstrate if proposed controls are adequately managing seepage required 9 months after licence amendment issue. See section 3.2 for further information.
2.2.2	Request to remove now that results have been submitted as required by condition 3.2.1 (no results provided for condition 3.2.2).	The department will authorise additional dewatering for a period of 6 months from the issue of licence amendment only. The licence holder is required to submit information which satisfied condition 3.2.2 within 3 months of licence amendment issue. See section 3.2 for further information.
3.2.1 (Table 3.2.1)	Request for a suspension of monitoring until a time when discharge to Chalice West Lake recommences (Includes monitoring of D1, D2, D3, C1, C2). Discharge to Chalice West lake ceased in August 2014, the lake ecology report provided by Karora shows that the lake has recovered	This request is outside the scope of this assessment. While discharge to Chalice West Lake has ceased, the Lake Ecology survey by Actis (June, 2020) indicates that although trending towards baseline, a return to baseline has not yet

Licence: L9155/2018/1

Licence Condition	Summary of Licence Holder's comment	Department's response
	close to baseline values and will reach baseline values following another 1-2 years of average rainfall. The monitoring of Chalice West lake should not be required until a time when discharge may recommence in the future.	occurred. Removal of annual monitoring from Chalice West Lake will therefore require further risk assessment. A requirement for annual monitoring will therefore remain on the licence.
3.2.2	Request for modification of condition 3.2.2 to specify discharge monitoring sites MBS112 & MBS113 to remove ambiguity.	The condition has been modified to reflect MBS112 and MBS113 monitoring sites.
3.5.1 (Table 3.5.1)	Request to remove 4m bgl trigger limit from HMB1, HMB3, HMB4, HMB5 and HMB9. Bores are suggested to be too close and more reflective of water levels around the immediate embankments and not of potential impact to the environment (native vegetation).	The condition has been modified to remove 4m bgl trigger from HMB1, HMB3, HMB4, HMB5 and HMB9. Other monitoring requirements listed in condition 3.5.1 remain on the licence for the purpose of long term trend analysis.
Figure 1	Requested update of figure to replace logo	Figure 1 has been updated
Figure 2	Requested update to figure to replace logo	Figure 2 has been updated
Figure 3	In response to request for an updated figure the licence holder indicates that "no better map for figure 3 was available"	Figure 3 in it's current form will remain on the licence, however the department recommends the licence holder consider updating this figure at a later time, particularly if seeking amendments associated with the Chalice pit.
Figure 5	Request to remove Figure 5 from the licence due to duplication of information provided in Figure 4	Figure 5 provides closer aerial imagery without overlaying graphics of Baloo pit and it's context in relation to Lake Cowan and consequently provides value by remaining on the licence.
Figure 7	Attached in higher resolution	Figure 7 has been updated
Figure 9	Update Figure 9 including depiction of both Aphrodite and Vine Monitoring bores on one figure	Figure 9 has been updated and previous Vine in-pit figure removed
Decision Report	Summary of Licence Holder's comment	Department's response
Table 3	Update to noise controls and embankment erosion controls	Table 3 updated to reflect controls
Section "Summary of Applicant Controls – Seepage Management"	Update of controls: "Water then pumped back into TSE into the lined decant water ponds (these are the small LDPE lined ponds on the south-eastern corner) for reuse in the processing plant "	Applicant controls updated

Appendix 4: Application validation summary

SECTION 1: APPLICATION SUMMARY				
Application type				
Works approval	<input type="checkbox"/>			
Licence	<input type="checkbox"/>	Relevant works approval number:		None <input type="checkbox"/>
		Has the works approval been complied with?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Has time limited operations under the works approval demonstrated acceptable operations?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Date Report received:		
Renewal	<input type="checkbox"/>	Current licence number:		
Amendment to works approval	<input type="checkbox"/>	Current works approval number:		
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L9155/2018/1	
		Relevant works approval number:		N/A <input type="checkbox"/>
Registration	<input type="checkbox"/>	Current works approval number:		None <input type="checkbox"/>
Date application received	10/06/2020			
Applicant and Premises details				
Applicant name/s (full legal name/s)	Avoca Mining Pty Ltd			
Premises name	Higginsville Gold Operations			
Premises location	Existing: M15/351, M15/289, M15/225, M15/642, M15/348, M15/31, M15/786, M15/506, M15/507, M15/620, M15/629, M15/639, M15/640, M15/580, M15/581, M15/597, L15/225, L15/288, L15/302, G15/19, G15/23, M15/528, M15/231, M15/748, M15/512, M15/352, M15/610, M15/375, M15/338, M15/1790, M15/1814, L15/282 and L15/347 To be added: General purposes lease (G) 15/26, 15/27, 15/29 Miscellaneous Licence (L) 15/382, 15/389; and Mining Tenement (M) 15/325, 15/681 and 15/817			
Local Government Authority	Shire of Coolgardie			
Application documents				
HPCM file reference number:	DWERDT293088			
Key application documents (additional to application form):	Attachment 1a – Tenement summary reports Attachment 1B – ASX Extract Attachment 1C – Letter of Authority			

	<p>Attachment 2 – Premises map Attachment 3A and 3B – TSF2-4 Design Report – Coffey April 2020 Attachment 3C – Proposed clearing area Attachment 7: – Appendix A – Premises map – Appendix B – Tenement summary reports – Appendix C – TSF2-4 Design Report – Coffey April 2020 – Appendix D – Seepage Recovery and Seepage Management Plan – Appendix E – Groundwater recovery and seepage management plan – Appendix F – GHD Higginsville Biological Report – Appendix G – AQ2 Water Management Plan – Appendix h – Bennelongia Ecological Survey of Lake Crown – Appendix I – AHIS tenement summary – Appendix J – Tailings Characterisation Analytical Report – Appendix K – TSF Operational Manual – Appendix L – HGO Risk Assessment – TSF Cell 2 Stage Life Supporting Information – Final 9 June Attachment 8 – Proposed fee calculator Sensitive receptors map</p>
Scope of application/assessment	
<p>Summary of proposed activities or changes to existing operations.</p>	<p>Construction Activities:</p> <ol style="list-style-type: none"> 1. TSF2 raised by 2.5m to RL1315m for tailings storage 2. TSF2-4 raised by 2.5m to RL1317.5m for tailings storage 3. TSF2-4 raised by 2.5m to RL1320m for tailings storage 4. TSF2-4 raised by 2.5m to RL1325.5m for tailings storage <p>Commissioning: As-constructed report to be supplied for all proposed TSF raises on TSF2-4</p> <p>Proposed activities: Recommission TSF2, TSF3, TSF4, this will provide an additional 5 years of tailings storage. If a new TSF5 were to be built in proximity to the existing facility it would require clearing of approximately 70-80 ha of native vegetation.</p> <p>Application also seeks to increase annual dewater discharge to Lake Cowan from Baloo pit to 1,800,000k/L that was assessed in the existing licence for an annual discharge of 1,000,000kL. Dewatering of Baloo pit will cease in 2021.</p>

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

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: processing or beneficiation of metallic or non-metallic ore	1,500,000 tonner per year	N/A
Category 6: Mine dewatering	1,900,000 tonnes per year	4,100,000 tonnes per year
Category 54: Sewage facility	No more than 200m ³ /day	N/A
Category 64: Class I or II putrescible landfill	20 tonnes or more per year	N/A

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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input type="checkbox"/> General lease <input type="checkbox"/> Expiry: Mining lease / tenement <input type="checkbox"/> Expiry: Other evidence <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Approval: Expiry date: If N/A explain why?
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input type="checkbox"/>	CPS No: N/A Clearing <10ha
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Application reference No: Licence/permit No:

<p>Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>Name: N/A Type: Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Regional office:</p>	
<p>Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/></p>	
<p>Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx</i>)</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p><i>Mining Act</i></p>	
<p>Is the Premises within an Environmental Protection Policy (EPP) Area?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>		
<p>Is the Premises subject to any EPP requirements?</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>		
<p>Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i>?</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>Classification: possibly contaminated – investigation required (PC–IR) Date of classification: 14/11/2008</p>	