Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

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

Licence Number	L8532/2011/2
Licence Holder	Genesis Minerals (Leonora) Pty Ltd
ACN	667 073 681
File Number	DER2014/000885-1
Premises	Kailis Mine Mining Tenements M37/46, M37/219 and M37/564, M37/902, M37/955, M37/986 and L37/221 LEONORA WA 6438 As defined by the Schedule 1: Maps, figure 1 attached to the Revised Licence
Date of Report	15 October 2024
Decision	Revised licence granted

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A/SENIOR MANAGER, RESOURCE INDUSTRIES
INDUSTRY REGULATIONS
Officer delegated under section 20 of the Environmental Protection Act 1986

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1. Decision summary

Licence L8532/2011/2 is held by Genesis Minerals (Leonora) Pty Ltd (Licence Holder) for the Kailis Mine (the Premises), located at Mining Tenements M37/46, M37/219 and M37/564, M37/902, M37/955, M37/986 and L37/221 LEONORA WA 6438

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 operation of the Premises. As a result of this assessment, Revised Licence L8532/2011/2 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 Amendment summary

On 14 June 2024, the Licence Holder submitted an application to the department to amend Licence L8532/2011/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Condition 2, Table 3: Authorised Discharge Points
    - Amend Emission to include Mine Dewater from Harbour Lights.
    - Amend Discharge point to include Kailis Pit (depicted in Figure 1).

The request to add Kalis Pit as an additional discharge will allow for movement of water across Kailis, Trump and Harbour Lights pits to manage water levels to support the Tower Pit mining operations.

In the current licence allows:

- Mine dewater discharge from Kailis Pit to Trump Pit; and
- Mine dewater discharge from Kailis Pit and Trump Pit to Harbour Lights Pit.

This amendment is limited only to changes to Category 6 activities from the Existing Licence. No changes to the production capacity (1,300,000 tonnes per annual period) of the existing Licence relating to Category 6 has been requested by the Licence Holder.

All dewatering infrastructure is already approved and constructed under Mining Proposal Reg ID 59686 and licenced for operation under this Licence. No additional infrastructure is proposed under this licence amendment application.

2.2.1 Estimated discharge to Kailis Pit over five years

Kailis pit holds about 965,648 tonnes of water at present and has not been dewatered from since 2019 (GML, 2024). The Kailis Pit has capacity for an additional 8,100,000 tonnes of water, between the current water level (post-mining level) and the designated maximum level (359 m AHD, 17 m below the pit crest).

The Table 1 demonstrates the Kailis pit has capacity to accept discharge rate of 1,215,000 tonnes per annum for five years (GML, 2024). It is below the existing design capacity as 1,300,000 tonnes per annum. Furthermore, it remains under the designated maximum level (359 m AHD, 17 m below the pit crest) and Kailis pit capacity (6,075,000 tonnes > 8,100,000 tonnes).

Table 1: Estimated discharge to Kailis pit over next five years

Year	Volume to be discharged to Kailis Pit from Harbour Lights (Tonnes)	Kailis Pit discharge balance (Tonnes)	Start of year SWL (mAHD)	End of year SWL (mAHD)	Kailis target SWL (mAHD)
1	1,215,000	1,215,000	309	322	359
2	1,215,000	2,430,000	332	331	359
3	1,215,000	3,645,000	331	339	359
4	1,215,000	4,860,000	339	346	359
5	1,215,000	6,075,000	346	352	359

Table provided as part of licence amendment supporting application.

The Licence Holder also holds Licence L8337/2009/2 for the Gwalia Mine, which is situated south of the Kailis Mine (this licence). The department approved an amendment Licence L8337/2009/2, in August 2024 to allow dewatering from Tower Pit to Harbour Lights Pit and authorised an increase in dewatering capacity (from 2,500,000 to 5,500,000 tonnes/annum). The amendment to the Kailis Mine licence is required to support the dewatering increase at Gwalia Mine.

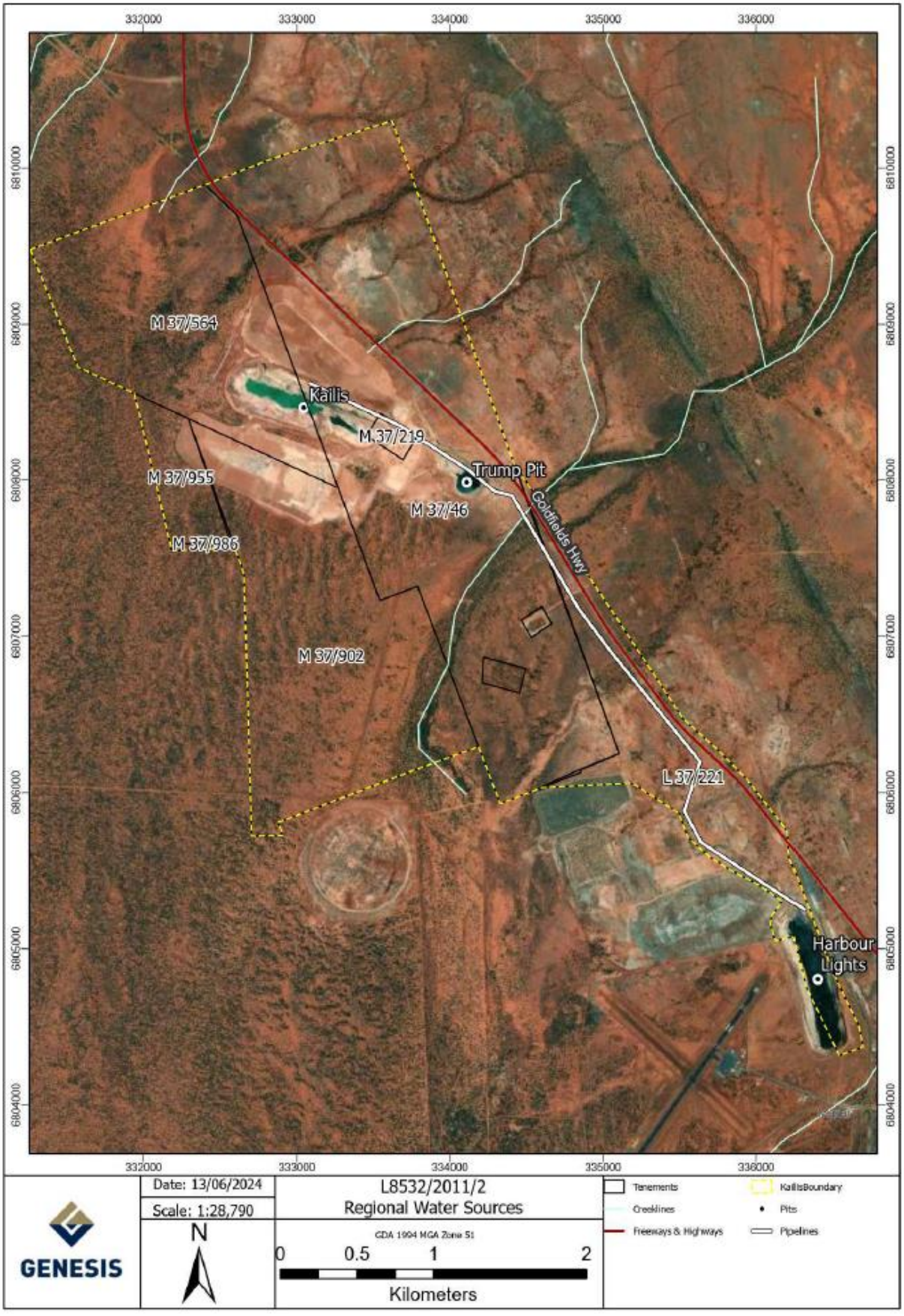

Figure 1: Genesis Minerals Kailis Operations Risk assessment

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.

2.3 Source-pathways and receptors

2.3.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises 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.

Pipeline spills, leaks and/or ruptures have been excluded from this assessment as the infrastructure is existing and assessed by the department in previous risk assessments.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls (GML, 2024)
Hypersaline mine dewater: Total Dissolved Solids (TDS) average 62,900-83,200 mg/L	Overtopping of Kailis Pit	Direct discharge to land Surface Run-off	○ Maintain water level in pit to that of recorded static levels to ensure pits remain as groundwater sinks. ○ Additional monitoring of discharge (volume kL) to Kailis Pit as per Table 6 in existing Licence L8532/2011/2. ○ Additional inspection of Kailis Freeboard as per Table 5 in Operating Licence L8532/2011/2.
	Seepage of saline dewatering migrating from pit walls and base	Infiltration to groundwater cause for groundwater mounding	○ Maintain water level in pit to that of recorded static levels to ensure pits remain as groundwater sinks. ○ Maintain ability to move water between pits to mitigate risks of mounding.

2.3.2 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.

Although the Town of Leonora is located 300m southeast of the premises boundary, the proposed activities do not have a foreseeable impact on these receptors and therefore they have not been considered in this risk assessment.

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**
Aboriginal and other heritage sites – Nambi Village (Nambi Road Village) under Katampul Aboriginal Corporation	• Place ID: 36741 – Kailis-1 Archaeological Site - Artefacts / Scatter – About 500 m west of the Kailis pit • Place ID: 37998 – SAR07 Site 4 Trump Creek Camp Site - Artefacts / Scatter; Camp; Historical – About 1.2 km southeast of the Kailis pit • Place ID: 37999 – SAR07 Site 6 Trump Creek Historic Coach Station and Hotel Archaeological Site - Artefacts / Scatter; Camp; Historical – About 1.3 km southeast of the Kailis pit No ground disturbance or changes to landscape.
Environmental receptors	**Distance from prescribed activity**
Threatened Ecological Communities (TEC's) and Priority Ecological Communities (PEC's)	Melita calcrete groundwater assemblage type on Raeside paleo drainage on Melita (Sons of Gwalia) Station (P1) - About 3.5 km of Kailis pit – Thus, TEC's are not within close proximity of the proposed upgrade activities. Melita Calcrete PEC boundary – About 5 km of Harbour Lights pit.
Threatened and/or priority flora	*Angianthus prostrates* – About 1 km of the Harbour Lights pit.
Threatened and/or priority fauna	Bird species visually sighted about 1 km and 1.5 km from Harbour Lights Pit: WA Listing - Specially Protected – Migratory; and WA Listing - Specially Protected - other specially protected. Nine species of conservation significance are considered likely to occur in the Kailis area. These were the • Peregrine Falcon (*Falco peregrinus*), • Fork-tailed Swift (*Apus pacificus*), • Rainbow Bee-eater (*Merops ornatus*), • Bush Stone-curlew (*Burhinus grallarius*), • Australian Bustard (*Ardeotis australis*), • Grey Honeyeater (*Conopophila whitei*), • Woolley's Pseudantechinus (*Pseudantechinus woolleyae*), • Kultarr (*Antechinomys laniger*) and • *Aprasia picturata*
Groundwater - Goldfields Groundwater area	Project area lies within the Goldfields Groundwater area. **Groundwater levels:** Trump pit area- 19-35 mbgl Kailis pit area- 19-23 mbgl **TDS:** Trump pit area – 40,000 – 70,000 mg/L Kailis pit area – 60,000 – 70,000 mg/L **pH:** Trump pit area – 7-8 Kailis pit area – 7-8

2.4 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 in-complete they have not been considered further in the risk assessment.

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

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

The Revised Licence L8532/2011/2 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. category 6 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 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**				
Operation (Category 6: Mine dewatering)								
Overtopping of Kailis pit	Hypersaline mine dewater	Direct discharge to land and surface run-off resulting in native vegetation death	Surrounding vegetation Aboriginal heritage sites	Refer to Section 3.1	C = Moderate L = Rare **Medium Risk**	Y	Condition 3: Infrastructure and equipment controls Condition 4: Inspection of infrastructure requirements Condition 9 and 10: Monitoring	N/A

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 and storage of hypersaline dewater into Kailis Pit	Hypersaline mine dewater	Seepage and infiltration causing groundwater mounding, resulting in native vegetation death	Groundwater Surrounding vegetation	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 3: Infrastructure and equipment controls Condition 4: Inspection of infrastructure requirements Condition 9 and 10: Monitoring	Pit water salinity at Harbour Lights pit pre-mining was found to be hypersaline with a TDS about 58,600 mg/L. Data from 2023 monitoring has confirmed that TDS concentration (salinity) of the water in Harbour Lights pit is now (on average) about 80,000 mg/L (AER, 2023). Pit water salinity at Trump pit and Kailis pit are (on average) about 68,000 mg/L and 65,200 mg/L (AER, 2023). Pit water pH shows the same range from 7.96-8.19 in all three pits (AER, 2023). Due to similar dewater characteristics (TDS and pH) at both the Trump and Kailis pits, impact of seepage to environment can be managed by current conditions of the licence. The consequence of this risk event has been deemed to be medium due to the potential for low level on-site impacts and minimal off-site impacts occurring.

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.

3. Consultation

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

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 6 August 2024	No comments received	N/A
Licence Holder was provided with draft amendment on 25 September 2024	The Licence Holder requested to amend the first line of the emissions column in Table 2 of the licence to allow the Trump pit to accept dewatering from Harbour Lights pit as a staging pit.	The department considered the comments and updated the condition as required.
	The Licence Holder responded to the department request regarding the Figure 1 map.	The department considered the submitted map and updated the Figure 1.
	The Licence Holder responded to the clarification regarding the current depth to groundwater, TDS and pH.	The department considered the submitted information and updated the Table 3.

4. 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.

4.1 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
2	Table 2: Added a new emission as mine dewater from Harbour Lights Pit and discharge points as Kailis pit and Trump pit.
2	Table 2: Added a new emission as mine dewater from Kails pit and Harbour Lights Pit and discharge point as Trump pit.
4	Table 4: Added Kailis pit as an inspection infrastructure.
9	Table 5: Added Kailis pit as a new discharge and monitoring point reference.
Schedule 1	Added new revised figure for figure 1.

Condition no.	Proposed amendments
Whole document	Converted into new format licence: • Removal of Explanatory Notes section • Moving definitions to back of condition set • Licence History added • Updates to Interpretation section part (d) • Updates to condition wording • Removal of former condition 1 (and Table 2) which outlined authorised emissions (now considered as a redundant condition) • Updates to conditions/table numbers as required • Removal of Schedule 2

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. Genesis Minerals Limited (GML) 2024, *Kailis Mine – Application for licence amendment L8532/2011/2, Version 1*, Perth, Western Australia.