



Application for Licence Amendment

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

Licence Number	L9013/2016/1
Licence Holder	Gascoyne Resources Limited
ACN	139 522 900
File Number	DER2016/002214
Premises	Dalgaranga Gold Project Mining Lease 59/749 and Miscellaneous Licence 59/151 DAGGAR HILLS WA 6638
Date of Report	18 August 2020
Decision	Revised licence granted

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1. Decision summary

Licence L9013/2016/1 is held by Gascoyne Resources Limited (GRL) for the Dalgara Gold Project (the Premises) located within Mining Lease 59/749 and Miscellaneous Licence 59/151. The Dalgara Gold Project incorporates mining of ore from Gilbeys and Golden Wings deposits, which is then processed through a dry processing plant and a carbon-in-leach (CIL) gold processing plant. Tailings are deposited at Gilbeys TSF and the Golden Wings in-pit TSF.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges associated with the modification and operation of Gilbeys TSF. As a result of this assessment, Revised Licence L9013/2016/1 has been granted.

The Revised Licence issued as a result of this amendment supersedes the existing Licence previously granted in relation to the Premises.

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 Amendment summary

On 28 April 2020 the Licence Holder submitted an application to the Department to amend the Licence under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The Licence Holder requires additional tailings storage at the premises and proposes to construct two additional embankment raises on Gilbeys TSF (Stage 4 and 5 raises) to RL449.5m.

Following construction, tailings will be delivered via the existing slurry pipeline to Gilbeys TSF. Decant from Gilbeys TSF will be returned to the processing plant via the existing decant return pipeline. The TSF raises (to RL449.5m) will provide additional capacity of approximately 2.95Mt, which is equal to a storage life of 14 months based on a tailings production rate of 2.5Mtpa.

DWER has assessed the risk of emissions and discharges associated with proposed construction of Stage 4 and 5 embankment raises and operation of Gilbeys TSF.

The relevant prescribed premises category is category 5. The Licence Holder has not proposed any change to the approved production/design capacity of 2.8 Mtpa.

No changes to the existing Licence relating to Category 85 and 89 have been requested by the Licence Holder.

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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a risk event.

3.1 Emissions

The key emissions associated with the **modification and operation** of Gilbeys TSF which have been considered in this Amendment Report are:

- Noise (during construction of Raises 4 and 5).
- Dust (during construction of Raises 4 and 5).
- Increased seepage of tailings leachate.
- Overflow of tailings decant water.

As the Applicant has advised the existing tailings slurry pipeline and decant return pipeline will continue to be used, the risk from these has not been reassessed.

3.2 Human receptors

DWER's Geographic information systems (GIS) database indicates there are no residences in the vicinity of the premises. The nearest town is Mt Magnet, located approximately 60km south-east of the premises. GRL has further advised the nearest residence is greater than 25km away from the premises. It is therefore considered there are no residences that may be impacted by emissions/discharges associated with the assessed activity.

In accordance with the *Guidance Statement: Risk Assessment* (DER 2017), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

3.3 Environmental receptors

Table 1 below provides a summary of potential environmental receptors that may be impacted as a result of emissions/discharges associated with the assessed activity.

Screening of potential risk events is also outlined in Table 1.

Table 1: Potential environmental receptors

Environmental receptors	Description and distance from the prescribed activity	Screening for risk event
Surface soils and remnant native vegetation	In the vicinity of Gilbeys TSF	Potential receptors to: <ul style="list-style-type: none">- Seepage from the TSF embankments;- Groundwater level rise due to seepage from the modified TSF; and- Overflow from the TSF
Soil	Beneath Gilbeys TSF	Potential receptor of seepage from the modified TSF.
Groundwater	Groundwater in the Gilbeys TSF area is understood to occur within a fractured rock aquifer system. Average groundwater levels for the period April-May 2020 indicate steep hydraulic gradients have developed within, and the vicinity of, the Gilbeys TSF footprint as a result of Gilbeys pit	Potential receptor of seepage from the modified TSF.

	<p>dewatering. The gradient is further steepened due to seepage from Gilbeys TSF.</p> <p>Groundwater flow is towards Gilbeys pit.</p>	
Cattle	<p>Groundwater wells in the region may be used for stock watering.</p> <p>Based on a survey completed in 2016, the Licence Holder has advised there are groundwater wells located between 4.4km and 14.8km away from Gilbeys TSF. The nearest well is Paddy's Well located approximately 4.4.km north-west of Gilbeys TSF. The nearest well with an operating windmill is Gumi Well located approximately 9km north-west of Gilbeys TSF.</p>	<p>Screened out.</p> <p>Assessment of groundwater levels for Gilbeys TSF and the adjacent evaporation pond (completed for the April-May 2020 period) indicates groundwater flow is towards Gilbeys pit. Considering this assessment, and the separation distance to the aforementioned wells, potential seepage from the TSF is not expected to migrate through to existing well locations.</p>

3.4 Risk ratings and regulatory controls

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

Where the Licence Holder has proposed mitigation measures/controls 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 2.

The Revised Licence L9013/2016/1 that accompanies this Amendment Report authorises emissions associated with the modification and operation of Gilbeys TSF.

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

Table 2. Risk assessment of potential emissions and discharges from the Premises during commissioning and operation

Risk Event					Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence (summary)	Justification for additional regulatory controls
Source/ Activities	Potential emission	Potential pathway/s	Potential receptors and impact	Licence Holder's controls				
Commissioning and operation								
Operation of Gilbeys TSF	Increased Tailings leachate seepage: Dissolved solids; Acidified water; Metal enriched water; Arsenic & Cyanide.	Migration of tailings leachate through TSF embankments (and adjacent WRDs) and through to surrounding land	Receptors: Soils and remnant native vegetation in the vicinity of the TSF Impact: Soil contamination. Degraded or deceased vegetation.	<ul style="list-style-type: none">▪ Decant water recovery system to maximise the volume of water returned to the processing plant;▪ Maintenance of the decant pond as far as practically possible away from the perimeter embankments;▪ Seepage interception trench constructed in the corridor between the south-eastern embankment of Gilbeys TSF and Gilbeys Pit. Trench constructed to intercept potential seepage from the embankment toe. Seepage is collected in a sump containing an auto-start float pump which discharges back to the Gilbeys TSF decant.	<p>Medium</p> <p>Consequence = Minor</p> <p>Likelihood = Possible</p> <p>Potential impacts on soils and vegetation are expected to be in the vicinity of the TSF. The Licence Holder has reported evidence of surface seepage along a section of the toe of the south-eastern embankment (identified in March 2020). This area is considered to be the most likely area of impact due to the existing observations and as the embankment is not surrounded by a WRD (as is the case for the other TSF embankments).</p>	Yes	The risk event is acceptable subject to conditions summarised below: <u>Infrastructure requirements</u> <ul style="list-style-type: none">▪ Raise 4 and 5 works to incorporate a decant water recovery system as specified. <u>Operational requirements</u> <ul style="list-style-type: none">▪ Inspection of decant pond; and▪ Inspection and maintenance of TSF seepage interception trench to maintain a freeboard of >1.5m at all times.	N/A
		Seepage of leachate through the base of the TSF	Receptors: Soil beneath TSF; Groundwater Impact: Soil contamination; Groundwater contamination	<ul style="list-style-type: none">▪ Decant water recovery system;▪ Maximising the volume of water returned to the processing plant.	<p>Medium</p> <p>Consequence = Minor</p> <p>Likelihood = Likely</p> <p>The Licence Holder has reported a gradual rise in groundwater level in bores IMB01, IMB02 and IMB03 attributable to seepage from Gilbeys TSF.</p> <p>Additionally, seepage modelling undertaken for the raise 4 and 5 design indicates there will be increased seepage impact from the TSF as a result of the stage 4 and 5 raises.</p> <p>Additional seepage of tailings leachate to groundwater is therefore considered likely to occur.</p> <p>Seepage from Gilbeys TSF is expected to flow towards Gilbeys pit (groundwater sink) which is located approximately 200m to the south-east. The adverse impact to groundwater quality is therefore expected to be localised.</p>	Yes	The risk event is acceptable subject to conditions summarised below: <u>Infrastructure requirements</u> <ul style="list-style-type: none">▪ Raise 4 and 5 works to incorporate a decant water recovery system as specified. <u>Operational requirements</u> <ul style="list-style-type: none">▪ Completion of a monthly water balance; and▪ Completion of Gilbeys TSF groundwater well monitoring as specified. <u>Annual reporting</u> <ul style="list-style-type: none">▪ Reporting of water balance data; and▪ Reporting and assessment of groundwater monitoring data.	N/A

Risk Event					Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence (summary)	Justification for additional regulatory controls
Source/ Activities	Potential emission	Potential pathway/s	Potential receptors and impact	Licence Holder's controls				
		Seepage of leachate through the base of the TSF and associated groundwater mounding	Receptors: Soils and native vegetation in the vicinity of the TSF Impact: Soil contamination; Degraded or deceased vegetation.	<ul style="list-style-type: none"> Decant water recovery system; Maximising the volume of water returned to the processing plant; Addition of new monitoring wells IMB08; IMB09; IMB10; and IMB11 to the Gilbeys TSF monitoring well network; SWL trigger of 2.5 mBGL for Gilbeys TSF monitoring wells; and Construction/operation of seepage recovery bores RB13, RB14, RB15 and RB16 to the north-west of Gilbeys TSF. 	<p>Medium</p> <p>Consequence = Minor Likelihood = Possible.</p> <p>The Licence Holder has reported a gradual rise in groundwater level in bores IMB01, IMB02 and IMB03 attributable to seepage from Gilbeys TSF. Additionally, seepage modelling undertaken for the raise 4 and 5 design indicates there will be increased seepage impact from the TSF as a result of the stage 4 and 5 raises. The increased seepage impact from the TSF may result in groundwater level rise beyond the TSF/WRD footprint. I.e. the modelling undertaken indicates the groundwater level may rise to within 2.5m below ground level in an arc north of the West WRD. The potential impact to soils and native vegetation in this area is expected to be localised.</p>	No	<p>The risk event is acceptable subject to conditions summarised below:</p> <p><u>Infrastructure requirements</u></p> <ul style="list-style-type: none"> Raise 4 and 5 works to incorporate a decant water recovery system as specified; and Construction of additional monitoring wells IMB08; IMB09; IMB10; and IMB11. <p><u>Operational requirements</u></p> <ul style="list-style-type: none"> Completion of a monthly water balance; and Completion of Gilbeys TSF groundwater well monitoring as specified – <u>includes a SWL trigger of 7mBGL and SWL limit of 4mBGL for Gilbeys TSF monitoring wells.</u> <p><u>Specified actions</u></p> <ul style="list-style-type: none"> <u>Submission of a revised Gilbeys TSF seepage management plan within 60 days of this licence amendment.</u> <p><u>Annual reporting</u></p> <ul style="list-style-type: none"> <u>Reporting of water balance data; and</u> Reporting and assessment of groundwater monitoring data. <p><u>Quarterly reporting</u></p> <ul style="list-style-type: none"> <u>Quarterly reporting of Gilbeys TSF groundwater well standing water level data.</u> <p><u>Notification</u></p> <ul style="list-style-type: none"> <u>Report exceedance of groundwater well SWL limit.</u> 	Due to the potential limitations of the Gilbeys TSF seepage modelling, monitoring and recovery plan DWER requires the risk to be managed through suitable triggers/limits and enhanced monitoring for the implementation of a suitable management response.
Tailings decant water; Dissolved solids; Acidified water; Metal enriched water; Arsenic & Cyanide.	Overflow from TSF due to excess loading or heavy rainfall or both		Receptors: Soils and remnant native vegetation in the vicinity of the TSF/WRD footprint; Groundwater Impact: Soil contamination; Degraded or deceased vegetation; Groundwater contamination	<ul style="list-style-type: none"> Tailings delivery and discharge arrangement; Decant water recovery system; Operational freeboard of 0.3m; Beach freeboard of 0.2m; Total freeboard of 0.5m; TSF designed to contain a 1 in 100-year AEP, 72hour duration storm rainfall event of 185mm above the normal operating decant pond level; and 	<p>Medium</p> <p>Consequence = Minor Likelihood = Unlikely.</p> <p>Overflow of tailings decant may migrate to areas beyond the TSF/WRD footprint and/or to Gilbeys Pit. Impacts on soils and vegetation are expected to be in the vicinity of the TSF/WRD footprint.</p> <p>A pathway to groundwater may exist via Gilbeys pit, however, as groundwater flow is towards Gilbeys pit impacts on groundwater are expected to be localised.</p>	Yes	<p>The risk event is acceptable subject to regulatory controls summarised below:</p> <p><u>Infrastructure requirements</u></p> <ul style="list-style-type: none"> Raise 4 and 5 to be constructed as specified. <p><u>Operational requirements</u></p> <ul style="list-style-type: none"> Daily inspection of embankment freeboard and decant pond. 	N/A

Risk Event					Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence (summary)	Justification for additional regulatory controls
Source/ Activities	Potential emission	Potential pathway/s	Potential receptors and impact	Licence Holder's controls				
				<ul style="list-style-type: none"> Daily inspection of embankment freeboard and decant pond. 	The multiple controls proposed by the Licence Holder are considered to reduce the likelihood of an overtopping event to a rating of unlikely.			

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 and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 3 provides a summary of the consultation undertaken by the Department.

Table 3: Consultation

Consultation method	Comments received	Department response
Request for comment/advice issued to DMIRS on 1 July 2020	Excerpt of response from DMIRS dated 27 July 2020: While the presence of seepage in the south eastern upstream embankment wall adjacent to an active open pit is of concern, Dalgaranga are expected to ensure safety of the facility and the workforce is maintained at all times, and as such the Mining Proposal is now acceptable to DMIRS.	It is understood the Mining Proposal for Gilbeys TSF raise 4 and 5 is acceptable to DMIRS. DWER acknowledges that DMIRS has the primary regulatory responsibility for approving design aspects of TSFs pertaining to structural integrity issues. The scope of this assessment does not include determination of risks and assessment of controls pertaining to TSF structural integrity failure.
Request for comment issued to the Licence Holder on 13/08/2020	Comments outlined in Appendix 2	Responses outlined in 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 4 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 4: Summary of licence amendments

Condition no.	Proposed amendments
1	New condition Design/construction/installation requirements for Gilbeys TSF stage 4 and stage 5
2	New condition Design/construction/installation requirements for new groundwater monitoring wells IMB08, IMB09, IMB10, IMB11
3	New condition Gilbeys TSF to be operated in accordance with the conditions of the Licence, following submission of construction compliance reports.
4	Amended condition Operational requirements for Gilbeys TSF and Gilbeys TSF seepage interception trench
5	New condition Emissions condition replacing Condition 1 of the Licence
7	Amended condition

	The word "shall" replaced with "must"
8	Amended condition The word "shall" replaced with "must" Inspection of infrastructure table amended
9	New condition Undertake a monthly water balance for Gilbeys TSF
10	New condition Requirement to submit revised Gilbeys TSF seepage management plan
11	Amended condition The word "shall" replaced with "must" Inspection of infrastructure table amended
12	Amended condition The word "shall" replaced with "must" Inspection of infrastructure table amended
13	Amended condition New requirements for Gilbeys TSF groundwater monitoring wells
17	New condition Infrastructure construction compliance reporting
18	New condition Groundwater monitoring well construction compliance reporting
19	Amended condition Updated record keeping requirements
20	Amended condition Updated complaints recording requirements
21	Amended condition Updated condition relating to Annual Audit Compliance Report
22	New condition Quarterly reporting of Gilbeys TSF groundwater well SWL data
23	Amended condition Updated requirements relating to Annual Environmental Report

Appendix 1: Key documents

Document title	In text ref	Availability
Licence amendment application and supporting documents received 28 April 2020	Application	DWERDT275916, DWERDT275197
Additional information submitted by the Licence Holder, received 1 June 2020 – including report dated 28 May 2020 <i>Gilbeys TSF seepage assessment and management options</i>	Application	A1907626
Technical advice from DWER Principal Hydrogeologist, dated 22 July 2020	N/A	A1916486
Submission received from the Department of Mines, Industry Regulation and Safety, 27 July 2020	N/A	A1917193
Submission received from Licence Holder, received 13 August 2020	Application	A1924136

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

Condition / Amendment report section	Summary of Licence Holder's comment	Department's response
Licence conditions	Letter from Mike McCracken – General Manager GNT Resources. Dated 14 August 2020 I wish to advise that GNT accept licence conditions as amended as per your letter of 13 August 2020 ref:DER2016/002214-1~4, and waiver the 21 day review period.	Noted.
Condition 1, Table 1: Infrastructure and equipment requirements Gilbeys TSF embankment stage 4 and stage 5	Operational freeboard to be maintained is 0.5m	DWER notes the Gilbeys TSF stage 4 and stage 5 design specifications note a 0.3m operational freeboard and 0.5 total freeboard. Condition 4 requires the Licence Holder to maintain a minimum 0.3m operational freeboard and 0.5m total freeboard.
Condition 4 – Table 3 Infrastructure and equipment operational requirements - Gilbeys TSF seepage interception trench Section 3.4 Risk ratings and regulatory controls – Table 2.	Figure 1 has been attached depicting the TSF seepage interceptor trench location. The bunded TSF interceptor trench has been constructed to accumulate seepage into a sump containing an auto-start float pump, which discharges back to the TSF decant. Daily inspections of the TSF seepage interceptor trench are undertaken by processing personnel. To date, the trench freeboard has been >1.5 m at all times. Details of a Trigger and Response Plan (TARP) will be provided in the TSF Seepage Management Plan to be forwarded to DWER by 30 October 2020.	The description of the Licence Holder's controls in Table 2 of this Amendment Report has been updated. Site Plan 7 illustrating the location of the seepage interception trench has been added to the Licence. The risk of tailings seepage migrating through the TSF embankment walls and through to surrounding land is deemed medium risk and acceptable subject conditions. Condition 4 and Condition 8 require the Licence Holder to inspect and maintain the seepage interception trench to maintain a freeboard of >1.5m at all times. Trigger and Response Plan to be included with the revised Gilbeys TSF Seepage Management Plan.
Schedule 1 Maps – Site Plan 4 Gilbeys TSF groundwater monitoring bores	Please refer to the previously provided Groundwater Resource Management (2020) <i>Gilbeys TSF Seepage Assessment and Management Options</i> report depicting the locations of the proposed recovery bore network and four new TSF monitoring bores (IMB08-11). For your convenience, Figure 6 from the GRM	Condition 2 requires the addition (construction and development) of new monitoring wells (IMB08, IMB09, IMB10 and IMB11) to the monitoring well network prior to operation of Gilbeys TSF embankment stage 4. Conditions 18 and 13 require submission of a monitoring

Condition / Amendment report section	Summary of Licence Holder's comment	Department's response
	(2020) report has been attached illustrating the bore locations.	<p>well construction report and monitoring of parameters as specified.</p> <p>Condition 10 requires the submission of a revised Gilbeys TSF Seepage Management Plan by 30 October 2020 as specified - including a review of the siting of groundwater well and groundwater recovery bore locations. DWER recommends a suitable geophysical survey is undertaken to determine the current distribution of groundwater seepage and identify areas where seepage may take place when the TSF embankments are raised. Such investigations would identify targets where additional groundwater monitoring wells and recovery bores should be located.</p>
Section 2 Scope of assessment – Section 2.2 amendment summary	The Gilbeys pit lake was fully dewatered in March 2020. On-going Gilbeys pit dewatering to maintain working conditions is undertaken via two dewatering bores (PBG03 and PBG06A) located around the pit edge (Figure 6) and an in-pit sump / ponton pump. The overall volume of pit dewatering has decreased significantly now the Gilbeys pit-lake has been completed. Any abstracted pit dewatering continues to be utilised for ore processing and dust control requirements.	DWER notes the management of mine dewater is outside of the scope of the assessed application. Further information will be requested from the Licence Holder in regard to the management of mine dewater to determine requirements under Part V of the <i>Environmental Protection Act 1986</i> .
Section 3 Risk assessment – Section 3.1 Emissions	There is no change to the tailings pipeline route or decant system.	DWER understands the existing tailings slurry pipeline and decant return pipeline will continue to be used. The risk of spills from these pipelines has therefore not been reassessed. Condition 4 and Condition 8 require tailings slurry and decant return pipelines to be situated within bunded open trenches to contain potential leaks and daily inspection of pipeline condition.