



Application for Works Approval

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

Works Approval Number	W6702/2022/1
Applicant	Beacon Mining Pty Ltd
ACN	603 853 916
File number	DER2022/000200~1
Premises	Lost Dog in-pit TSF (Panel 2/4) M16/529 and M16/560 COOLGARDIE WA 6429
Date of report	12 October 2022
Decision	Works approval granted

**A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES**

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W6702/2022/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary and overview of premises

On 5 May 2022, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction works to prepare the Lost Dog open pits (panel 2 and 4) to become the Lost Dog In-Pit Tailings Storage Facility 2/4 (Pit) at the Jaurdi Gold Project (Premises). The Premises is approximately 32.5 km north-west of Coolgardie on tenements M16/529 and M16/560 in the Shire of Coolgardie.

The Pit will receive gold ore tailings from the site's Carbon in Leach processing plant at a rate of 0.75 Mtpa, to a total of 2.55 Mt at the Life of Mine, with a slurry density of 35% solids. The pit is planned to serve 2.8 years out of the 6 year project life and supplement the existing tailings storage facilities (TSF) at the premises, currently operating under Licence L9247/2020/1. The existing pits comprise of the following In-Pit TSFs: Black Cat, Lost Dog Panel 1, Panther, and the surface TSF Jaurdi TSF.

Preparation works include the installation of:

- Tailings pipelines and return water pipelines;
- a pontoon mounted decant pump;
- spigots; and
- a network of 8 monitoring bores.

The premises relates to the category and assessed design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6702/2022/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6702/2022/1.

2.2.1 Fauna and Flora surveys

A level 1 fauna assessment (May 2020) and two targeted flora surveys (November 2020) for two threatened species; Arid Bronze Azure Butterfly and Malleefowl, were conducted to search for the presence of these listed species. No evidence was found that either the Malleefowl (i.e., mounds or tracks) or Arid Bronze Azure Butterfly (i.e., host ant or butterfly sightings) were present within the premises.

A level 2 flora and vegetation survey (July 2017) identified four specimens of priority species *Eremophila praecox* (P2) within the survey area. The nearest specimens are approximately 450 m west of the proposed Pit. There are no clearing activities expected to impact these flora.

Clearing for the project will be undertaken in accordance with clearing permit - CPS 7794/3.

2.2.2 Tailings Geochemical Assessment

Mineralogical assessment of the tailings in 2017 determined the dominant component of the tailings was dolomite with low grade opal and quartz, and trace amounts of goethite (hydrated iron oxide), iron, and halite (rock salt). Of the major and minor elements detected they were either below, or close to, those typically recorded for soils, regoliths and bedrocks derived from unmineralised terrain. This includes heavy metals copper (1.3 mg/L), nickel (0.1 mg/L), cobalt (0.12 mg/L), silver (0.004 mg/L), and tin (0.01 mg/L).

Total cyanide is considered elevated with a concentration of 120 mg/L; however, the Delegated Officer notes reduced dosages are planned during the actual milling process. Reducing Weak-Acid-Dissociable Cyanide (WAD cyanide) to 50 mg/L or below is important for the health vertebrate wildlife which may drink the tailings water, as well as for protecting the surrounding environment (soils, groundwater etc) from contamination, as outlined in the document *Guidance for use of the mining operations verification protocol* (International Cyanide Management Institute, 2021). However, given the decant is hypersaline, it is noted the salinity would likely be a natural deterrent to consumption by fauna.

Negligible presence of sulphides renders the tailings to be considered non-acid forming (NAF). The tailings were mildly alkaline with a pH of 8.3.

When compared to the tailings of the Panther Pit, (presented in Table 1 below), pH and the acid forming potential was found to be comparable. The tailings water is more saline. Cyanide values were elevated and as stated above, cyanide dosages will be reduced. Elements considered 10-100 times average-crustal abundance in the Panther Pit were less than 10 times the average in the Lost Dog In-Pit and not considered significant.

Table 1: Comparison of the constituents in the tailings from the Panther Pit and Lost Dog In-Pit (2/4) TSFs. Higher values are in bold.

Constituents	Panther Pit	Lost Dog In-Pit (2/4)
pH	8.3-8.5	8.3-8.4
TDS	24 g/L	51 g/L
Acid-forming potential	NAF	NAF
Total cyanide	72 mg/L	117 mg/L
WAD cyanide	70 mg/L	117 mg/L
Free cyanide	70 mg/L	95 mg/L
Arsenic	48.1 mg/kg (5.1 mg/L)	2.4 mg/kg (<0.01)
Selenium	0.62 mg/kg (3 mg/L)	0.07 mg/kg (<0.05 mg/L)
Nickel	1,505.7 mg/kg (0.557 mg/L)	271 mg/kg (0.1 mg/L)
Chromium	3,953 mg/kg (20 mg/L)	537 mg/kg (<0.1 mg/L)

2.2.3 Surface water assessment

There are no defined drainage lines which intersect the Jaurdi Gold Project site. Stormwater passing through the site takes the form of shallow overland or sheet flow in a broad northwest to southeast direction. There are no perennial or ephemeral drainage lines within the Lost Dog Panel 2/4 pit area however, one minor ephemeral drainage line intersects the proposed pipeline corridor.

Levee 1 (constructed as part of the Panel 4 pit mining and development of the Jaurdi TSF) will contain stormwater flows in a 1% AEP event from entering the Pit, by surrounding it to the north-west, west, and south with a height up to 2.6 m high (Figure 1). Stormwater flows from rain which falls inside the levee will be directed to a stormwater dam, preventing water which may become contaminated from interaction with tailings or hydrocarbon spills leaving the premises as an emission.

2.2.4 Seepage study

The seepage rate for the Pit was estimated using the average seepage modelled of 4.7 litres per second (lps) for existing pits; Panther In-Pit, Black Cat In-Pit, Lost Dog In-Pit Panel 1, and Jaurdi TSFs, under the assumption that daily water loading rates will be similar at 402 m³ per day.

Within the Pit, the lateral hydraulic conductivity is considered to be low, whereas the vertical conductivity is considered to be extremely low. It is assumed that there is vertical leakage from the base of the storage facilities.

Initial steady state seepage prediction model showed lateral seepage of 20m after 10 years at a rate of 2.0 m/year. When modelled in transient mode mound forms up to 55 m and lateral seepage movement of 115 m over 10 years was predicted. When the model was re-run without the loadings from Pit, the results were similar to the models of the other TSF and mounding reduced to 20 m. The inclusion of eight interception bores into the model reclaiming seepage at 0.80 lps (73 m³ per day) and supply bores were also shown to prevent a mounding scenario of 55 m.

Groundwater modelling does not predict any significant off-site migration of tailings seepage. Impacts to vegetation, the groundwater aquifer, other users, surface water and subterranean fauna are considered to be unlikely.

The quality of the groundwater is considered poor as it is saline to hypersaline with total dissolved solids ranging from 24,000 to 77,000 mg/l. Groundwater and reclaimed seepage will be re-used on onsite processing activities and for dust suppression.

The seepage study, use of bore for both monitoring and groundwater recovery, and potential alternative groundwater recovery measures were reviewed internally by DWER's hydrogeologist, with the findings summarised below.

Modelling

DWER's Hydrogeologist noted the modelling of tailings disposal at the site used a model classified as having the lowest level of confidence for predicting changes to the groundwater flow regime that are caused by an imposed stress on an aquifer. This is because the model was largely calibrated using estimated values of aquifer parameters rather than from measurements of these parameters that were obtained by testing at the site.

The height of the groundwater mound was independently assessed using aquifer parameters that were provided in the seepage study report. The predicted elevation of the mound (about 45 metres) was similar to that produced by the applicant's model, that is, the predicted elevation of the groundwater mound caused by tailings disposal in the Lost Dog pit is plausible. However, the independent assessment of mounding indicated that the elevation of the mound was very sensitive to changes to aquifer parameters like hydraulic conductivity and

storage coefficient, and to the thickness of the aquifer.

The predicted height of the groundwater mound was particularly sensitive to the initial saturated thickness of the aquifer, and mounding increases where the aquifer is at its thinnest. This could be a significant issue for the area near the Lost Dog pit, where a silcrete unit forms a local perched aquifer. If this unit is laterally extensive near this pit, water perching on this unit could further increase the elevation of the mound that is produced by seepage from tailings disposal.

The seepage report suggested that the groundwater mound beneath the Lost Dog pit would progressively develop over about a ten-year period. However, this assessment does not consider the effects that tailings consolidation can have on groundwater mounding. As tailings consolidate, the pore-water they contain can be “squeezed out” into regolith or rocks surrounding the pit, which can increase the rate of seepage from the pit. Consequently, if tailings consolidation takes place quickly, the rate at which a groundwater mound can develop may also increase.

Use of bores for groundwater Recovery

It is not uncommon to find mine sites in Western Australia use groundwater monitoring bores also as recovery bores, however this is problematic for the following reasons:

- Monitoring bores are constructed with a diameter smaller than required for optimal groundwater recovery, which restricts the volume of water which can be pumped to develop a significant cone of depression;
- Screening intervals are also not compatible. Monitoring bores are often 3-6 m long to enable monitoring to take place at a discrete depth within an aquifer, while recovery bores are often indiscrete at more than 10 m long; and
- The remaining monitoring bores cannot accurately measure standing water level trends for the region if a significant number of monitoring bores are repurposed.

Hydraulic conductivity directly influences pumping efficiency. At the Lost Dog In-Pit TSF, the sediments in the paleochannel are largely clayey and have a low hydraulic conductivity. Although sand and gravel beds occur within the paleochannel, these appear to be poorly interconnected. Consequently, it is likely that many pumping bores would need to be installed in these sediments to control groundwater mounding near the Lost Dog pit.

Alternative approaches for managing groundwater mounding.

There is a large degree of uncertainty in the magnitude and timing of groundwater mounding that would take place as a result of tailings disposal in the Lost Dog pit. Additionally, it is not clear that the proposed groundwater recovery plan would be effective in controlling groundwater mounding. This is due to the generally low hydraulic conductivity of the paleochannel and bedrock aquifers in the area. Therefore, alternative methods to groundwater recovery bores include:

- The use of thickening, vacuum filtration or filter-press measures to reduce the water content of the tailings before they are discharged to the proposed in-pit TSF (understood to be more costly upfront); and
- The use of vertical wick-drains to increase water recovery from the deposited tailings.

Annual Environmental Report

The Annual Environmental Report (AER) provides the Department with monthly bore monitoring records for the Panther, Black Cat and Lost Dog in-pits at the Jaurdi Minesite. The parameters of concern include standing water levels and WAD cyanide. Standing water levels did not breach the licence limit of 6 m below ground level (bgl). Spikes in WAD cyanide occurred during late 2020 and early 2021 likely associated with the topping up of the pits, more acceptable levels

were reached by late 2021. By nature of in-pit TSFs, seepage generally occurs below the vegetation root zone and despite the clayey soils promoting lateral seepage, to date, no vegetation degradation has been observed in relation to TSF seepage.

2.2.5 Groundwater quality baseline

Groundwater quality from the Jaurdi TSF (Figure 5) provides baseline data for the Pit prior to construction under the Works Approval. The Jaurdi TSF is located approximately 650 m north of the Lost Dog In-Pit TSF. The data was collected from eight groundwater monitoring bores between February and August 2022 inclusive. Standing water levels ranged between 14.23 and 25.83 mbgl well below the vegetation root zone; pH ranged between 3.9 and 8.6 pH units, with two bores recording acidic levels below a pH of 5; Total dissolved solids ranged between 3,000 and 51,000 mg/L, making the water brackish to hypersaline; WAD cyanide was detected in trace amounts in half of the bores; and total cyanide was detected in trace amounts across all but one bore.

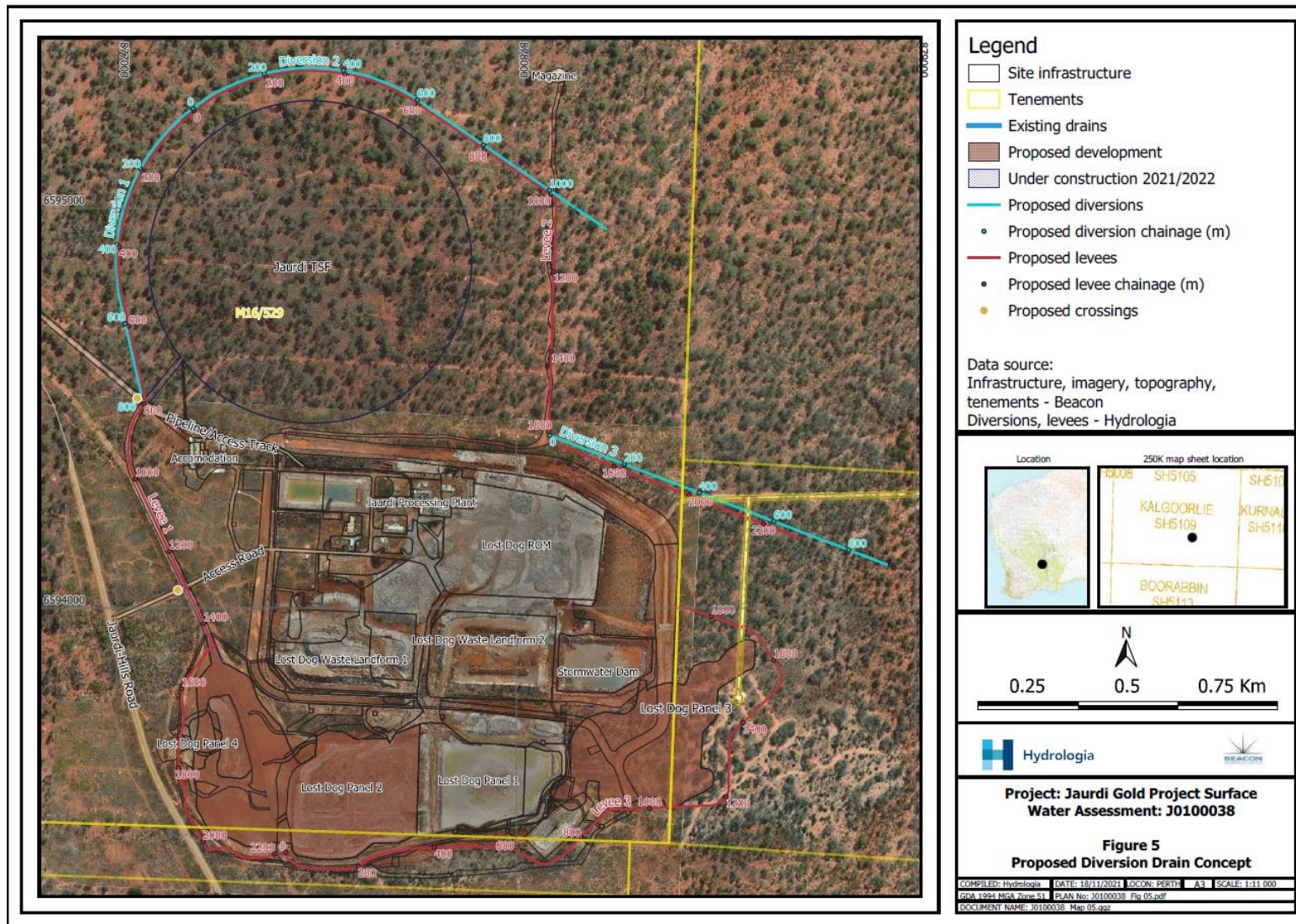


Figure 1 Stormwater levees and diversion drains surrounding the Jaurdi Prescribed Premises.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction operation which have been considered in this decision report are detailed in Table 2 below. Table 2 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 2: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Vehicle movements in relation to construction of pipelines and associated infrastructure.	Air / windborne	Road condition monitoring, use of water carts and vehicle speed conditions on unsealed roads.
Hydrocarbons	Hydraulic equipment failure and spills	Direct discharge	Hydrocarbon spills will be removed by absorbent material and/or excavation. Contaminated soils will be transported to the Bioremediation Facility for treatment. The Bioremediation Facility is located within the designated area of the Lost Dog waste landform and managed in accordance with the Bioremediation Facility Procedure. Contaminated waste materials from spill clean ups (filters, rags, hydrocarbon absorbent materials) will be collected in appropriately labelled waste containers and will be removed from site by a licensed contractor for disposal at an appropriate facility.
Commissioning			
Tailings	Commissioning of pipeline – spills or leaks from pipeline	Direct discharge	Tailings slurry will be transmitted through a PVC pressure pipeline while the return water will be transmitted through a HDPE Polyethylene pipeline. The tailings delivery and return water lines will be laid above ground within a bunded, cleared corridor, to cater for containment of up to 6

Emission	Sources	Potential pathways	Proposed controls
			<p>hours of spillage (up to 29% capacity) of the maximum tailings pumping. Leak detection measures incorporated in the facility operation will include;</p> <ul style="list-style-type: none"> • Continuous process control monitoring of flow meters at either end of the delivery lines with automatic shut off triggers; • Physical inspection of the pipeline corridors at least once per shift in accordance with the facility operating manual and DMIRS safety requirements; • Annual calibration of pipeline telemetry systems; and • Annual pipeline corridor audit to ensure pipeline bunding capacity is maintained. <p>In the event of a leak being identified, pumping will cease to allow repair of the leak. Clean up of any associated spillage of tailings or repair to the pipe corridor bunds will commence within 24 hours of the leak repair.</p>
Hydrocarbons	Hydraulic equipment failure and spills	Direct discharge	<p>Hydrocarbon spills will be removed by absorbent material and/or excavation. Contaminated soils will be transported to the Bioremediation Facility for treatment. The Bioremediation Facility is located within the designated area of the Lost Dog waste landform and managed in accordance with the Bioremediation Facility Procedure.</p> <p>Contaminated waste materials from spill clean ups (filters, rags, hydrocarbon absorbent materials) will be collected in appropriately labelled waste containers and will be removed from site by a licensed contractor for disposal at an appropriate facility.</p>
Operation			
Tailings	Transfer of tailings through pipeline - spills or leaks from pipeline	Direct discharge	<p>The tailings delivery lines will be laid above ground within a bunded, cleared corridor, to cater for containment of up to 6 hours of spillage (up to 29% capacity) of the maximum tailings pumping. Leak detection measures incorporated in the facility operation will include;</p> <ul style="list-style-type: none"> • Continuous process control monitoring of flow meters at either end of the delivery lines with automatic shut off triggers. (Use of pipeline pressure indication at the pump which will have a deviation alarm to alert the plant control of pressure changes); • Physical inspection of the pipeline corridors

Emission	Sources	Potential pathways	Proposed controls
			<p>at least once per shift (twice daily) in accordance with the facility operating manual and DMIRS safety requirements;</p> <ul style="list-style-type: none"> • Annual calibration of pipeline telemetry systems: <ul style="list-style-type: none"> ○ 10% variation in flow-visual alarm in processing control room and automatic shutdown of tails pumps after 45 minutes. ○ 30% variation in flow- visual alarm in processing control room and automatic shutdown of tails pumps after 15 minutes; and • Annual pipeline corridor audit to ensure pipeline bunding capacity is maintained. <p>In the event of a leak being identified, pumping will cease to allow repair of the leak. Clean up of any associated spillage of tailings or repair to the pipe corridor bunds will commence within 24 hours of the leak repair.</p>
	Discharge of tailings to Lost Dog TSF	Overtopping (towards end of pit life).	<ul style="list-style-type: none"> • Maintenance of a minimum operating freeboard of 700 mm. • A Tailings Operating Manual has been produced containing information on operating practices, maintenance requirements and reporting procedures. • Scheduled inspections are to be undertaken at least once per shift by TSF management to ensure the facility is being run as per the Tailing Operating Manual. • Geotechnical assessment of the TSF by a third party auditor will be undertaken annually.
Contaminated tailings water	Tailings stored in the in-pit TSF	Seepage through pit wall and base	<ul style="list-style-type: none"> • A network of eight groundwater monitoring bores will be established around the Lost Dog Panel 2/4 in-pit TSF. A baseline water quality survey will be undertaken, then sampled on a quarterly basis for early detection of seepage; • Minimisation of the surface area of the decant pond during operations; • Return of water to the plant will be maximised; • A Tailings Operating Manual has been produced containing information on operating practices, maintenance requirements and reporting procedures; • Scheduled inspections are to be undertaken at least once per shift by TSF management to ensure the facility is being run as per the

Emission	Sources	Potential pathways	Proposed controls
			<p>Tailing Operating Manual;</p> <ul style="list-style-type: none"> • A TSF inspection log will be completed for each inspection and be available to regulators for auditing purposes; • Commission recovery bores if required and when mounding is detected; • Implement Vegetation Monitoring when seepage is detected; • Geotechnical assessment of the TSF by a third party auditor will be undertaken annually; • The Jaurdi deposit does not contain any mafic host rocks. Tailing geochemical analysis and report of the tailings concluded that Chromium is detected as a solid but not detectable in solution, meaning the Chromium is non-mobile in solution and will not impact the groundwater; and • Modelling predicts low vertical hydrological conductivity and horizontal seepage of 115 m in 10 years. • Standing water levels will be monitored monthly to identify trends. Should any bores have an increasing trend, seepage recovery bores will commence pumping at those affected bores. • A trigger level of 6 mbgl will be applied and breach of this trigger will result in monitoring from monthly to fortnightly.
Decant water return	Saline water or water contaminated by heavy metals, etc.	Direct discharge	<p>The return water lines will be laid above ground within a bunded, cleared corridor, to cater for containment of up to 6 hours of spillage (up to 29% capacity) of the maximum tailings pumping. Leak detection measures incorporated in the facility operation will include;</p> <ul style="list-style-type: none"> • Continuous process control monitoring of flow meters at either end of the delivery lines with automatic shut off triggers; • Physical inspection of the pipeline corridors at least once per shift in accordance with the facility operating manual and DMIRS safety requirements; • Annual calibration of pipeline telemetry systems: <ul style="list-style-type: none"> ○ 10% variation in flow - visual alarm in processing control room and automatic shutdown of tails pumps after 45 minutes.

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> ○ 30% variation in flow - visual alarm in processing control room and automatic shutdown of tails pumps after 15 minutes; and • Annual pipeline corridor audit to ensure pipeline bunding capacity is maintained. <p>In the event of a leak being identified, pumping will cease to allow repair of the leak. Clean up of any associated spillage of tailings or repair to the pipe corridor bunds will commence within 24 hours of the leak repair.</p>
Dust	Tailings surface once tailings layers dry out.	Air / windborne	Tailings will be deposited underground below the surface which will minimise dust from being blown away from the tailings surface.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant's employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 3 and Figure 2 to Figure 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 premises (*Guideline: Environmental Siting* (DWER 2020)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity¹

Human receptors	Distance from prescribed activity
Pastoral Lease – Mt Burges Station	Prescribed premises boundary within Mt Burges Station pastoral lease.
Environmental receptors	Distance from prescribed activity
Groundwater – Proclaimed Groundwater Area - Goldfields	Groundwater has been encountered at 7 mbgl – 12 mbgl and is saline, ranging from 12,000mg/L to 77,000mg/L TDS.
Surface Water	A minor non-perennial watercourse runs through the prescribed premises boundary, flowing from west to the east and draining to an un-named surface water body approximately 15.5 km to the east (Figure 2).
Threatened Flora – <i>Eucalyptus educta</i> (P2) <i>Eremophila praecox</i> (P2)	1 record in 2014 located approximately 4.1 km north-west of the prescribed premises boundary. 4 records in 2017 located within the vicinity of the prescribed premises (Figure 3). (Two closest plants are 419 m west of the Lost Dog In-Pit TSF).
Native Vegetation	Within the prescribed premises boundary are six groups of native vegetation which surround the Pit (Figure 4).

Note 1: Only receptors within 1 km of the Prescribed Premises boundary were considered likely to be impacted from the activities.

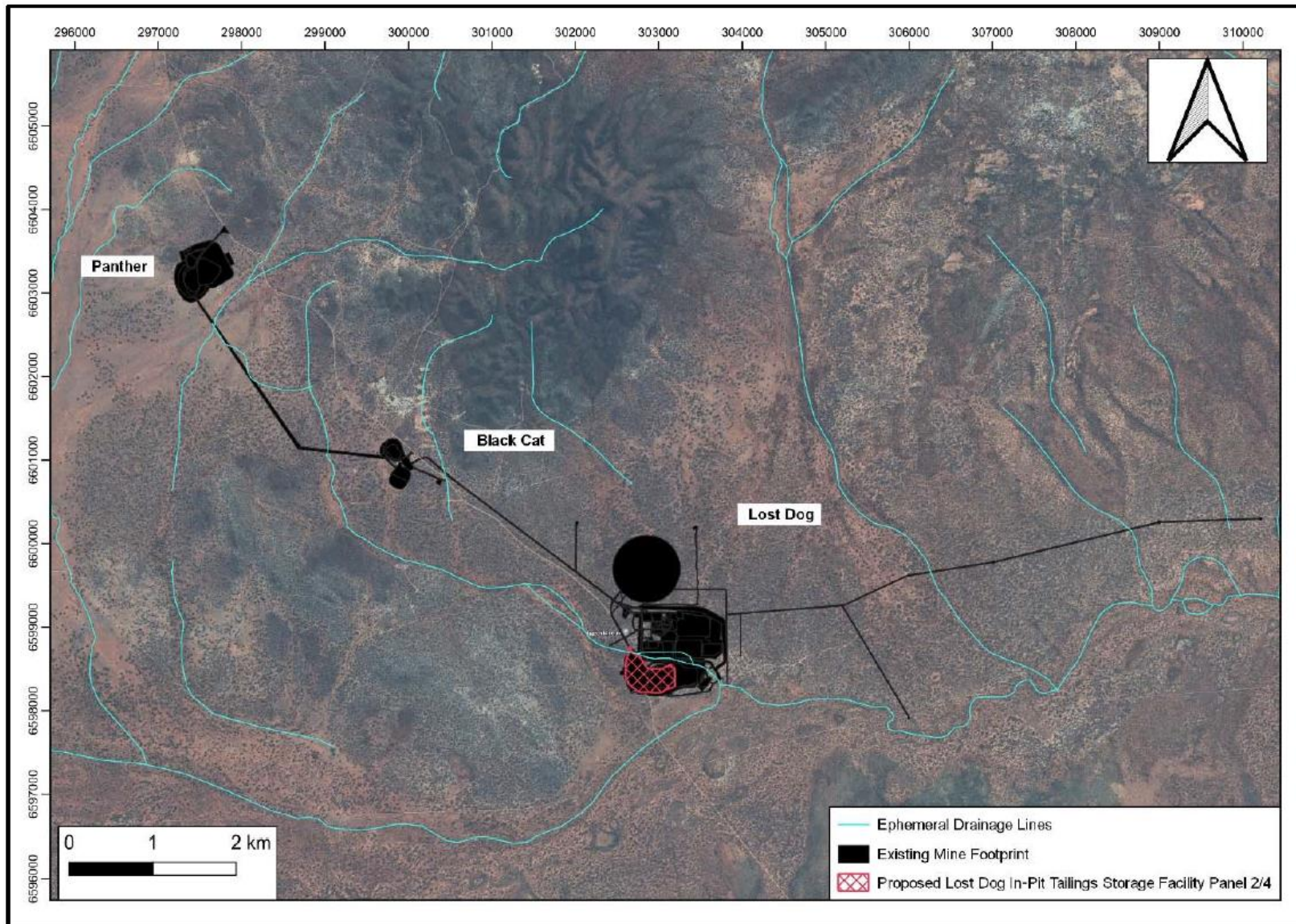


Figure 2: Minor ephemeral surface water course in relation to the Premises in-pit TSFs and pipelines

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Figure 3: Location of Priority Flora in relation to the Prescribed Premises

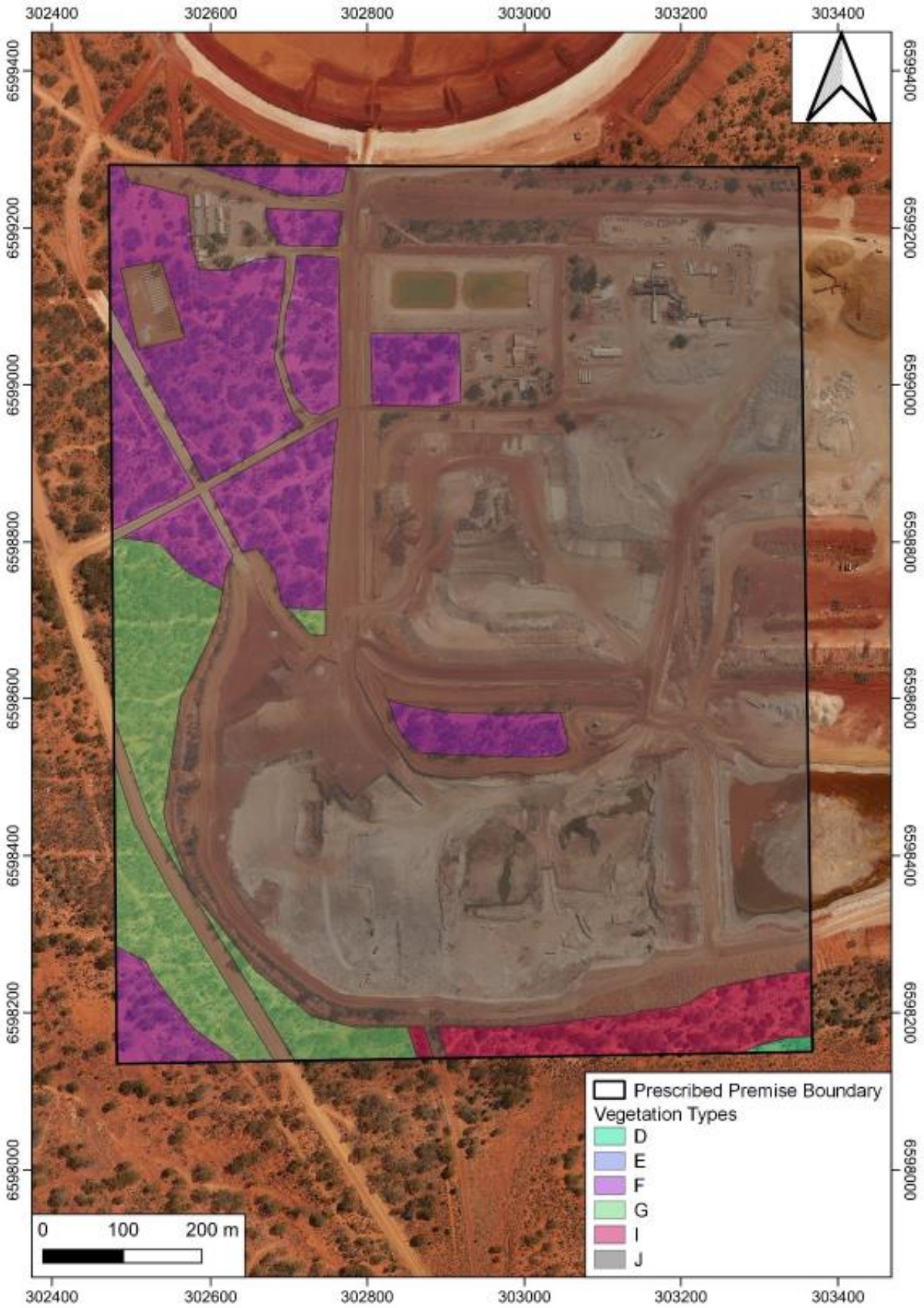


Figure 4 Vegetation groups within the Prescribed Premises boundary

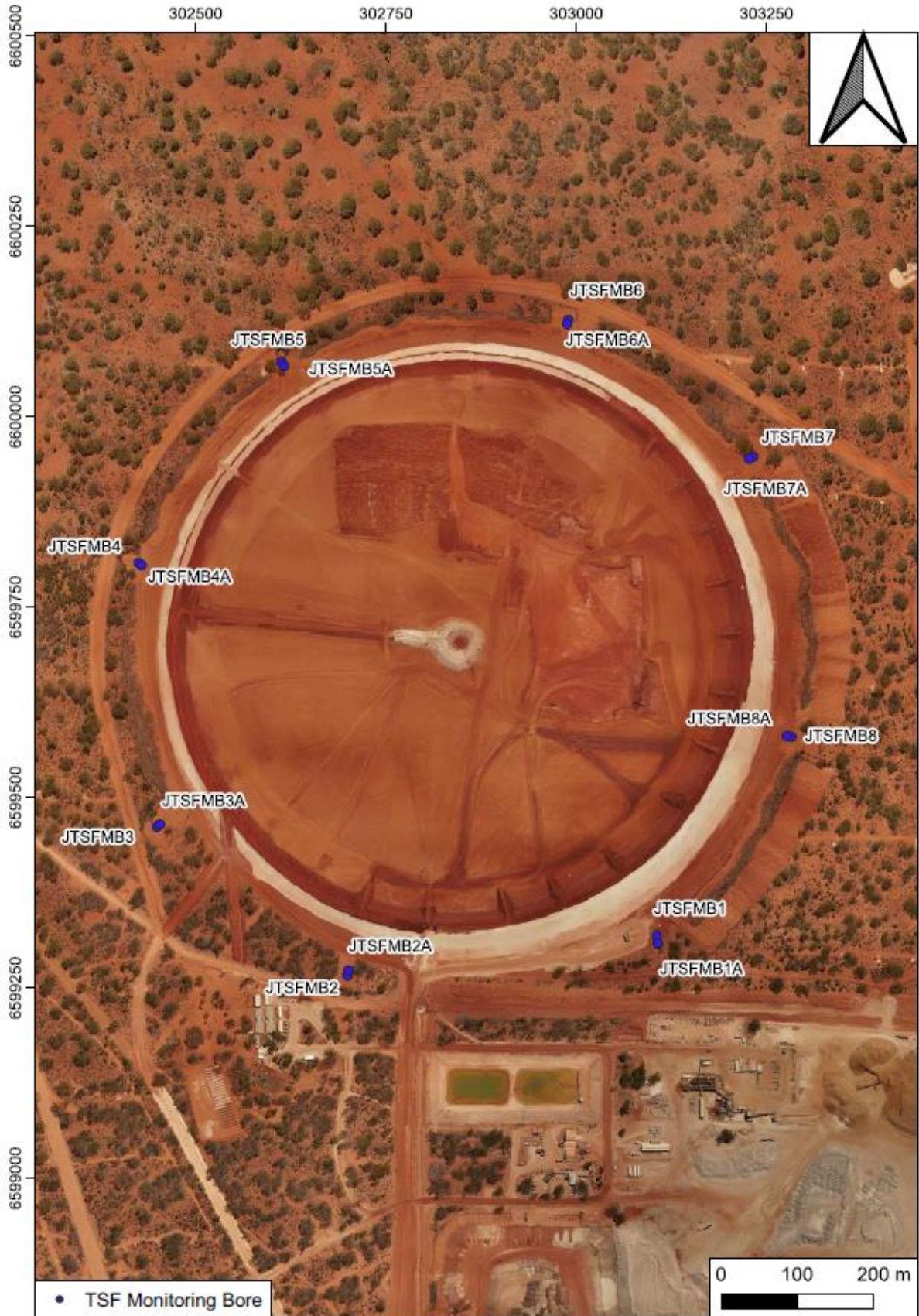


Figure 5: Locations of Jaurdi TSF monitoring bores

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 0. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 0), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

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

Works approval W6702/2022/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. mining and processing activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 4: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Construction								
Vehicle movements in relation to installation of pipelines and monitoring wells.	Dust	Air/windborne pathway then deposition upon leaves, impacting upon photosynthetic function.	Priority flora, native vegetation in vicinity of the pit.	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	None – the emissions during construction activities are short term and not expected to result in any impacts.	N/A
Hydraulic equipment failure and spills	Hydrocarbons	Direct discharge to ground contaminating root zone in soil and groundwater.	Native vegetation within premises	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y		N/A
			Groundwater		C = Slight L = Rare Low Risk	Y		N/A
Commissioning								
Commissioning of pipelines – spills or leaks from pipeline	Tailings and saline water	Direct discharge to ground causing contamination of soils and / or groundwater or impacts to vegetation.	Priority flora, native vegetation in vicinity of the pit.	Refer to Section 3.1	C = Minor L = Rare Low Risk	Y	Conditions 1, <u>2</u> , <u>3</u> , <u>4</u> , <u>5</u> , <u>6</u> , <u>7</u> , <u>8</u> , <u>9</u> , <u>10</u> and <u>11</u> .	Standard conditions for design and construction of infrastructure as constructed prior to commissioning: Condition 1: infrastructure table specifying design and installation requirements. Condition 2: Groundwater monitoring wells. Specifies the standards and reporting levels required for the monitoring
			Groundwater		C = Slight L = Rare Low Risk	Y		

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
								<p>bores to ensure the bores are capable of providing accurate results during the proposed groundwater monitoring program.</p> <p>Condition 3: as described in section 2.2.4, seepage recovery bores may not be the best option for managing seepage due to the low hydraulic conductivity of the paleochannel and bedrock aquifers in the area. The Delegated Officer has therefore added a condition for the applicant to install seepage recovery infrastructure prior to deposition of tailings and determined that monitoring bores should not be used simultaneously for seepage recovery.</p> <p>Reporting Conditions 4 and 5: compliance reporting on the construction of infrastructure.</p> <p>Standard conditions for commissioning of Infrastructure:</p> <p>Condition 6: infrastructure that may be commissioned.</p> <p>Condition 7: requires the commissioning of the pipelines to ensure the emission control infrastructure is functioning as designed.</p> <p>The risk of leaks from the</p>

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
								<p>pipeline over the lifetime of the infrastructure is sufficient to make conditioning of the emission control measures advisable.</p> <p>Conditions 8 and 9: Groundwater monitoring program as proposed by the applicant, is to allow for a baseline of measurements for comparison with future monitoring that will be required under licence conditions.</p> <p>Conditions 10 and 11: Commissioning reporting requirements</p>
Hydraulic equipment failure and spills	Hydrocarbons	Direct discharge to ground contaminating root zone in soil and groundwater.	Native vegetation within premises	Refer to Section 3.1	C = Slight L = Possible Low Risk	Y	None – the emissions due to construction activity are short term and limited in impact.	N/A
			Groundwater		C = Slight L = Rare Low Risk	Y		N/A

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Operation (including time-limited-operations operations)								
Discharge of tailings to Pit	Tailings	Ruptures, spills or leaks of pipelines causing direct discharge to ground and overland flow contaminating root zone in soil.	Priority flora, native vegetation in vicinity of the pit.	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Conditions 12, 13, 14 and 15	<p>Standard conditions for time limited operations:</p> <p>Condition 14: Infrastructure table: Specifies controls and monitoring requirements for authorised infrastructure during time limed operations</p> <p>Condition 15: Authorised discharge point.</p> <p>The short period of time the infrastructure may be operated under the works approval makes it improbable that the pit could overflow.</p> <p>Limiting the time which the premises may be operated under a works approval will require application for a licence or the amending of a licence, which will assess overtopping risk associated with the ongoing emissions from the premises.</p>
	Tailings	Overtopping of the pit causing direct discharge to land contaminating root zone in soil.	Priority flora, native vegetation in vicinity of the pit.	Refer to Section 3.1	C = Moderate L = Rare Medium Risk	Y		
	TSF supernatant potentially containing concentrations of elements with environmental significance (e.g., WAD and Total Cyanide.)	Seepage of the supernatant water, through basin and in-pit walls into root zone of vegetation and base of TSF contaminating the groundwater.	Priority flora	Refer to Section 3.1	C = Minor L = Rare Low Risk	Y	Conditions 3, 14, 15, 16, 17, 18 and 19.	
		Native vegetation in vicinity of the pit.	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	Y	<p>Condition 3: as described in section 2.2.4, seepage recovery bores may not be the best option for managing seepage due to the low hydraulic conductivity of the paleochannel and bedrock aquifers in the area. The Delegated Officer has therefore added a condition for</p>		

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
			Groundwater	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y		<p>the applicant to install seepage recovery infrastructure prior to deposition of tailings, and determined that monitoring bores should not be used simultaneously for seepage recovery.</p> <p>Condition 14: Infrastructure table: Specifies controls and monitoring requirements for authorised infrastructure during time limed operations</p> <p>Condition 15: Authorised discharge point.</p> <p>Conditions 16 and 17: specifies ambient groundwater monitoring and recording requirements, and includes standing water level limit of 6mbgl and WAD Cyanide limit of 50mg/L to ensure potential seepage impacts are detected / actioned as required to mitigate impacts to receptors.</p> <p>Condition 18: Monthly water balance requirements from the TSF to monitor water levels in the TSF, estimate seepage losses and inform water management for the TSF.</p>

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

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

4. Consultation

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

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 22 July 2022	None received.	N/A
Shire of Coolgardie advised of proposal on 22 July 2022	The Shire of Coolgardie reviewed the proposal and had no objections.	Noted.
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal 22 July 2022	DMIRS replied on date advising that their geotechnical inspector was the opinion that the proponent had considered the geotechnical aspects of the project and from a geotechnical perspective found the proposal to be acceptable.	Noted.
Mt Burges Pastoral Lease were advised of proposal on 22 July 2022	None received.	N/A
Applicant was provided with draft documents on 12 September 2022	The applicant responded on 5 October 2022 advising they do not have any comments and requested the application be finalised.	Noted.

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

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. Guidance for use of the mining operations verification protocol (International Cyanide Management Institute) June 2021

Appendix 1: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)				
Application type				
Works approval	<input checked="" 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 type="checkbox"/>	Current licence number:		
		Relevant works approval number:	N/A	<input type="checkbox"/>
Registration	<input type="checkbox"/>	Current works approval number:	None	<input checked="" type="checkbox"/>
Date application received	05/05/2022			
Applicant and premises details				
Applicant name/s (full legal name/s)	Beacon Mining Pty Ltd			
Premises name	Lost Dog in-pit TSF (Panel 2/4)			
Premises location	The Prescribed Premise intersects tenements M16/529 and M16/560. The Premise occurs within the Mt Burges Pastoral Lease (LA3114/1222).			
	Corner	GDA94		
		Latitude	Longitude	
		Point 1	-30.7232	120.9374
		Point 2	-30.7232	120.9467
		Point 3	-30.7336	120.9462
Point 4	-30.7334	120.9371		
Local Government Authority	Shire of Coolgardie			
Application documents				
HPCM file reference number:	DER2018/001042-7~45			
Key application documents (additional to application form):	<i>Attachment 1A: M16_560 Mining Tenement Report</i> <i>Attachment 1A: M16_529 Mining Tenement Report</i> <i>Attachment 1B: ASIC Company Extract</i> <i>Attachment 2: Premises Maps</i>			

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)

Attachment 3B: Works Approval Supporting Document
 Attachment 5: Stakeholder Engagement Register
 Attachment 7: Environmental Siting
 Attachment 9A: Works Approval Fee Calculation
 Appendix 1: Lost Dog inPit TSF Panel 2_4 TSF Design Report
 Appendix 2A: Lost Dog Tailings Geochemical Assessment
 Appendix 2B: Panther Tailings Geochemical Assessment
 Appendix 3A: Cross section of Lost Dog Panel
 Appendix 3B: Lost Dog Panel 4 Waste Material Laboratory Analysis
 Appendix 3B: Lost Dog Waste Material Laboratory Analysis
 Appendix 3C: Material Characterisation for Rehabilitation
 Appendix 4A: Level 2 Part 1 & 2 Flora Survey Report Jaurdi Hills
 Appendix 4B: Reconnaissance Flora and Vegetation Survey of the Jaurdi Gold Project
 Appendix 5A: Level 1 Fauna Assessment
 Appendix 5B: Vertebrate Fauna Survey
 Appendix 5C: Targeted Malleefowl Survey
 Appendix 5D: Targeted Arid Bronze Azure Butterfly Survey
 Appendix 6: Beacon Minerals - Standard Operating Procedure: Jaurdi Gold Project Bioremediation Facility
 Appendix 7: Stakeholder Consultation Register
 Appendix 8: Surface Water Assessment
 Appendix 9: Lost Dog Panel 2/4 Seepage Study

Scope of application/assessment

Summary of proposed activities or changes to existing operations.	Construction of an in-pit Tailings Storage Facility within the Lost dog Panel 2/4 at the Jaurdi Gold Project.
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Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic and non-metallic ore	700,000 tonnes per annum	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: N/A 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 checked="" type="checkbox"/>	Ministerial statement No: N/A EPA Report No: N/A

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)		
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No: N/A
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 checked="" type="checkbox"/> Expiry: M16/560 – 25/02/2040 M16/529 – 07/03/2032 Other evidence <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	Approval: Expiry date: LGA approval not required for active mine site.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	CPS No: CPS7794/3
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A Licence not required.
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: N/A Licence/permit No: GWL201802(4)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Name: Goldfields Groundwater Area Type: Proclaimed Groundwater Area Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Regional office: Goldfields
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to <u>WQPN 25</u>)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)

<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 checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p><i>Mining Act 1978</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 type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>Classification: N/A Date of classification: N/A</p>