



Application for Works Approval

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

Works Approval Number	W6488/2021/1
Applicant	Beacon Mining Pty Ltd
ACN	603 853 916
File Number	DER2020/000654
Premises	Jaurdi Gold Project Tailings Storage Facility Mining Tenement M16/529, COOLGARDIE WA 6429 As defined by the Premises maps attached to the issued works approval
Date of Report	14 July 2021
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 W6488/2021/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Decision Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary and overview of Premises

On 14 December 2020, Beacon Mining Pty Ltd (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 relating to construction of a tailings storage facility (TSF) at the Jaurdi Gold Project (the Premises). The TSF is a circular facility with a rock ring decant. The design allows for the containment of 2.0 Mm³ of tailings over a 3.3 year lifespan, assuming ore processing rates of 0.6 Mtpa and tailings in-situ density of 0.8t/m³. The embankment has a footprint of approximately 11.6 ha and will have a maximum embankment height of 9.6 m. Construction will include compaction of the area around the decant to a depth of 300mm, construction of a rock ring decant and walls of waste mine rock as the outer wall, lined with compacted clay and with a cut-off trench. Refer to attachments 1 and 2.

The Premises is approximately 33 km north-west of Coolgardie.

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 W6488. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guidance Statement: Risk Assessments* (DER 2017) are outlined in Works Approval W6488.

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 premises construction and operation which have been considered in this Decision Report are detailed in Table 1 below. Table 1 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Vehicle movements, and earthworks etc.	Air/windborne pathway	<ul style="list-style-type: none"> • A minimum 10m exclusion zone surrounding each Priority Flora record will be maintained. • Water trucks will be utilised on site access and haul roads, and during TSF construction to control dust as required. • Implementation of speed limits to reduce dust generation • Regular visual inspections of plant area to assess dust generation. • The nearest residential structure is greater than 30km south of the Project. • Road condition monitoring, water cart use and vehicle speed restrictions
Noise	Vehicle movements, and earthworks etc.	Air/windborne pathway	<ul style="list-style-type: none"> • All mining operations will comply with the noise regulations under the <i>Mines Safety and Inspection Act 1994, Mines Safety and Inspection Regulations 1995</i> and the <i>Environmental Protection (Noise) Regulations 1997</i>. • The nearest residential structure is greater than 30km south of the Project.
Commissioning			
Tailings – along tailings pipeline	Spills/leaks from the pipeline and associated infrastructure due to failure during testing of the pipeline	Direct deposit	<p>The pipeline corridor will be an earthen bunded trench, a minimum of 1 m deep, formed by the excavation of a trench 0.5 m deep with placement of the spoil as bunds either side of the trench (to a height of 0.5 m above ground level). (Attachment 3)</p> <p>The pipelines will be fitted with a leak detection system (telemetry system), which will be operated in the control room at the processing plant. The telemetry system will have two alarm systems and be calibrated on an annual basis:</p> <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. • The trench will be designed to contain the largest possible spill that could occur if a tails leak occurs (i.e. up to 29% capacity of the maximum pipeline flow).
Saline water – to test the pumps and	Spills/leaks from the pipeline and associated infrastructure	Direct deposit	<p>During the commissioning phases the following tailings parameters will be monitored:</p> <ul style="list-style-type: none"> • Feed rate;

Emission	Sources	Potential pathways	Proposed controls
decant water pipelines	due to failure during testing of the pipeline		<ul style="list-style-type: none"> • Slurry densities; • pH; and • TDS and Electrical Conductivity (analyses at a laboratory). <p>Monitoring of the tailings system and TSF will include:</p> <ul style="list-style-type: none"> • Inspection of the tailings discharge and return pipelines a minimum of twice per day; • Inspection of the TSF for any indication of seepage (daily during commissioning and operations); and • Inspection of the TSF for any fauna that may have become trapped in the tailings. <p>If a failure of pumps, pipelines or conduits occurs, then the system will be shut down until the fault is rectified.</p> <p>Surface water diversion to prevent contamination of clean stormwater:</p> <p>Part of the East Diversion Drain is to be closed by backfilling, approximately the first 600 m, so that any seepage from the TSF is not intercepted by the drain. This means that the residual length of the East Diversion Drain can only accept flow from the north east corner of the site downstream to the south. Refer to Attachment 5.</p> <p>Construction of two new drains and associated levees – Diversion 1 and 2. Refer to Attachment 5</p> <p>Diversion 1 will intercept stormwater intersecting the north and western side of the proposed TSF, the western side of the site and the proposed Lost Dog Panel 4 Pit. This drain will take some of the flow reporting to the Eastern Diversion Drain and most of the flow reporting to the Western Diversion Drain.</p> <p>Diversion 2 will join Diversion 1 north of the TSF and drain toward the east, discharging into the existing flow path on the edge of the mine tenement. This drain cannot extend past the edge of the current mine tenement. A levee alongside Diversion 2 will follow the tenement boundary down to the East Diversion Drain, preventing shallow overland flow from moving toward the TSF and the closed section of the East Diversion Drain. Significant flow will still enter the East Diversion Drain from the north east.</p>

Emission	Sources	Potential pathways	Proposed controls				
			Structure	Description	Length (m)	Size	Timing
Diversion 1:							
Diversion 1			Diversion channel extending from north of the TSF, past the western side of the site to south of the Lost Dog Panel 4 Pit.	2,587	3-10 m wide cut channel, 0-0.6 m deep.	Construct prior to developing the TSF and Lost Dog Panel 4 Pit.	
Levee 1			Levee to prevent ingress of floodwater to the site.	2,498	Levee, up to 3.1 m high.	Construct at the same time as Diversion 1.	
Diversion 2:							
Diversion 2			Diversion channel extending from north of the TSF toward the east, discharging to an existing shallow flow path.	828	3 m wide cut channel, up to 0.3 m deep.	Construct prior to developing the TSF and closing part of the East Diversion Drain.	
Levee 2			Levee to prevent ingress of floodwater to the site.	1,325	Levee, up to 1.9 m high.	Construct at the same time as Diversion 2.	
Operation							
Leachate	Storage of tailings in TSF	Through base of TSF	<p>Refer to the detailed risk assessment in Section 3.3 of this report for discussion on the design of the TSF.</p> <p>Management and monitoring of the facility for seepage impacts:</p> <ul style="list-style-type: none"> • Baseline and operations sampling from TSF monitoring bores (Attachment 4); • Minimisation of the surface area of the decant pond during operations; • Return of water to the plant will be maximised; • 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; 				

Emission	Sources	Potential pathways	Proposed controls
			<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 to be above 7m below ground level (bgl). • Implement Vegetation Monitoring when seepage is detected. • Geotechnical assessment of the TSF by a third party auditor will be undertaken annually. • A seepage intersection trench to be constructed if the standing water level (SWL) should reach 7mbgl. <p>Surface water diversion to prevent contamination of clean stormwater:</p> <p>Part of the East Diversion Drain is to be closed by backfilling, approximately the first 600 m, so that any seepage from the TSF is not intercepted by the drain. This means that the residual length of the East Diversion Drain can only accept flow from the north east corner of the site downstream to the south. Refer to Attachment 5.</p> <p>Construction of two new drains and associated levees – Diversion 1 and 2. Refer to Attachment 5</p>
	Decant water returning to processing plant	Direct deposit	<ul style="list-style-type: none"> • The tailings delivery line from the process plant to the TSF and the return water line will be situated within bunds in a pipeline corridor which act to contain any spillage of materials resulting from leaks or lines that burst during operation. • The pipeline corridor will be an earthen bunded trench, a minimum of 1 m deep, formed by the excavation of a trench 0.5 m deep with placement of the spoil as bunds either side of the trench (to a height of 0.5 m above ground level). (Attachment 3) • The pipelines will be fitted with a leak detection system (telemetry system), which will be operated in the control room at the processing plant. • Twice daily inspections of TSF pipelines during operation. • In the event flow meter readings indicate pipeline failure, the affected pipeline will be shut down until repaired and spilled material is collected and/or pumped, as appropriate, and deposited in the TSF.
Tailings	Spill/leaks of liquid tailings from the pipeline failure	Direct deposit	<ul style="list-style-type: none"> • The tailings delivery line from the process plant to the TSF and the return water line will be situated within bunds in a pipeline corridor which act to contain any spillage of materials resulting from leaks or lines that burst during operation. • The pipeline corridor will be an earthen bunded trench, a minimum of 1 m deep, formed by the excavation of a trench 0.5 m deep with placement of the spoil as bunds either side of the trench (to a height of 0.5 m above ground level). (Attachment 3) • The pipelines will be fitted with a leak detection system (telemetry system), which will be operated in the control room at the processing plant. • Twice daily inspections of TSF pipelines during operation. • In the event flow meter readings indicate pipeline failure, the affected pipeline will be shut down until repaired and spilled material is collected and/or pumped, as appropriate, and deposited in the TSF.

Emission	Sources	Potential pathways	Proposed controls
			<p>Surface water diversion to prevent contamination of clean stormwater:</p> <p>Part of the East Diversion Drain is to be closed by backfilling, approximately the first 600 m, so that any seepage from the TSF is not intercepted by the drain. This means that the residual length of the East Diversion Drain can only accept flow from the north east corner of the site downstream to the south. Refer to Attachment 5.</p> <p>Construction of two new drains and associated levees – Diversion 1 and 2. Refer to Attachment 5</p>
	Tailings as dust from surface of drying TSF	Air/windborne pathway	Manage tails deposition to ensure the conditions of the TSF beach minimise dust (i.e. moisture conditions).

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 applicant'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 2 and Figure 1 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)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Closest residential receptor	33km from southern edge of the premises boundary
Environmental receptors	Distance from prescribed activity
Underlying groundwater (non-potable purposes)	Groundwater is saline to hypersaline and the local groundwater level is estimated to be between 15mbgl and 24 mbgl. The TSF is located on clayey sediments which act as a semi-confining layer above a paleochannel aquifer the fractured basement rock aquifer. Outside of the paleochannel water is located in the underlying weathered bedrock interface. (Figure 4)
Un-named salt lake	4.6km south-west
Surface water drainage (Figure 3)	One ephemeral surface drainage line is intersected by the TSF with one other to the east and one to the west, approximately 500m and 350m respectively.
<i>Eremophila praecox</i> (Priority 2) (Figure 1)	Four plants within premise boundary. One plant 127m north-east, one plant 460m north-west of the TSF and two plants 1000m south-west.
<i>Leipoa ocellate</i> (vulnerable)	No evidence of Malleefowl were recorded (Terrestrial Ecosystems, 2020a). However, advice from DBCA to DMIRS during assessment of the Clearing Permit CPS7794/3, indicates that suitable habitat may be present. The clearing permit contains a modified fauna management condition requiring additional surveys for clearing during the breeding season will reduce potential impacts to any new Malleefowl individuals dispersing into the permit area.

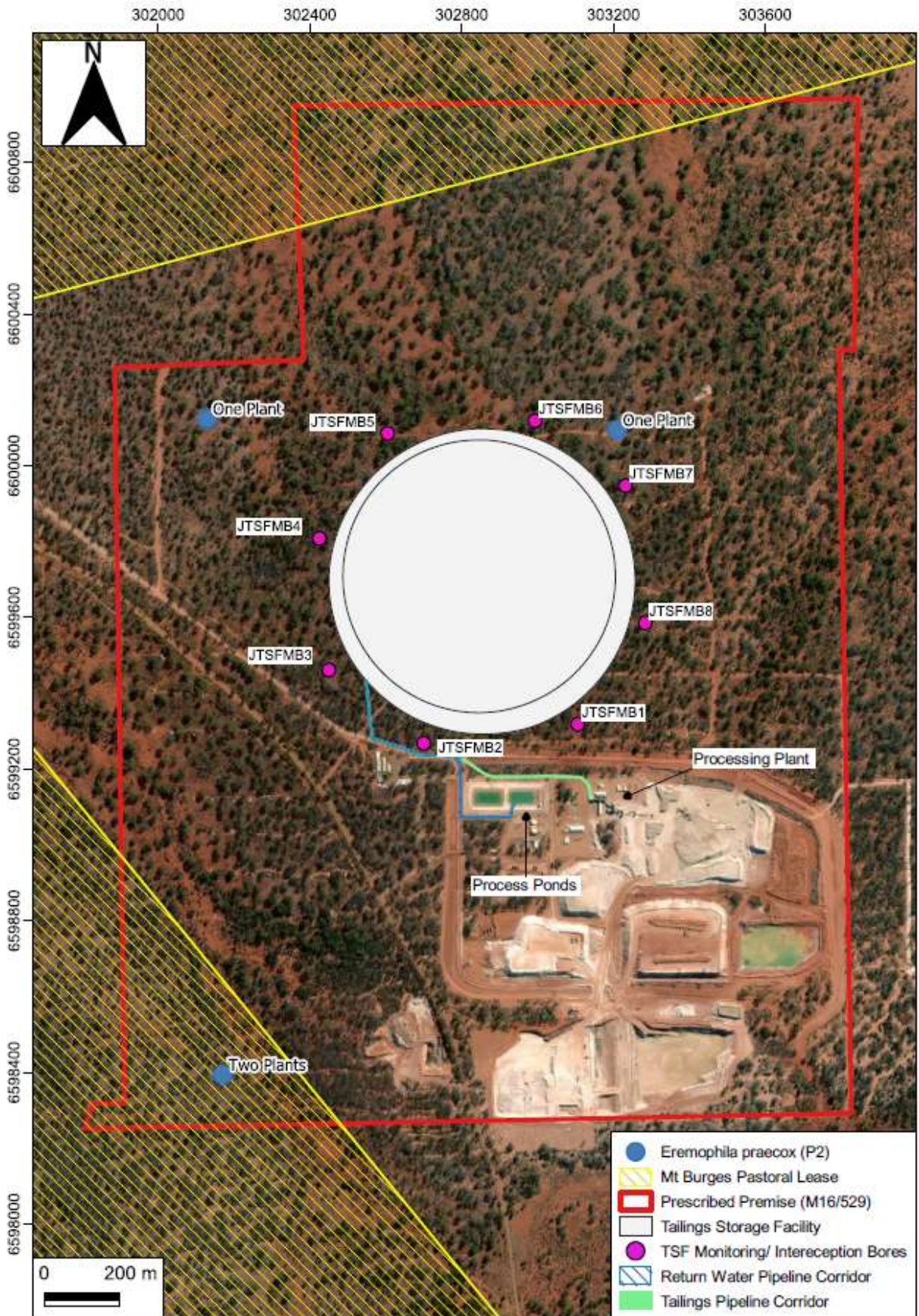


Figure 1: Distance to *Eremophila praecox*

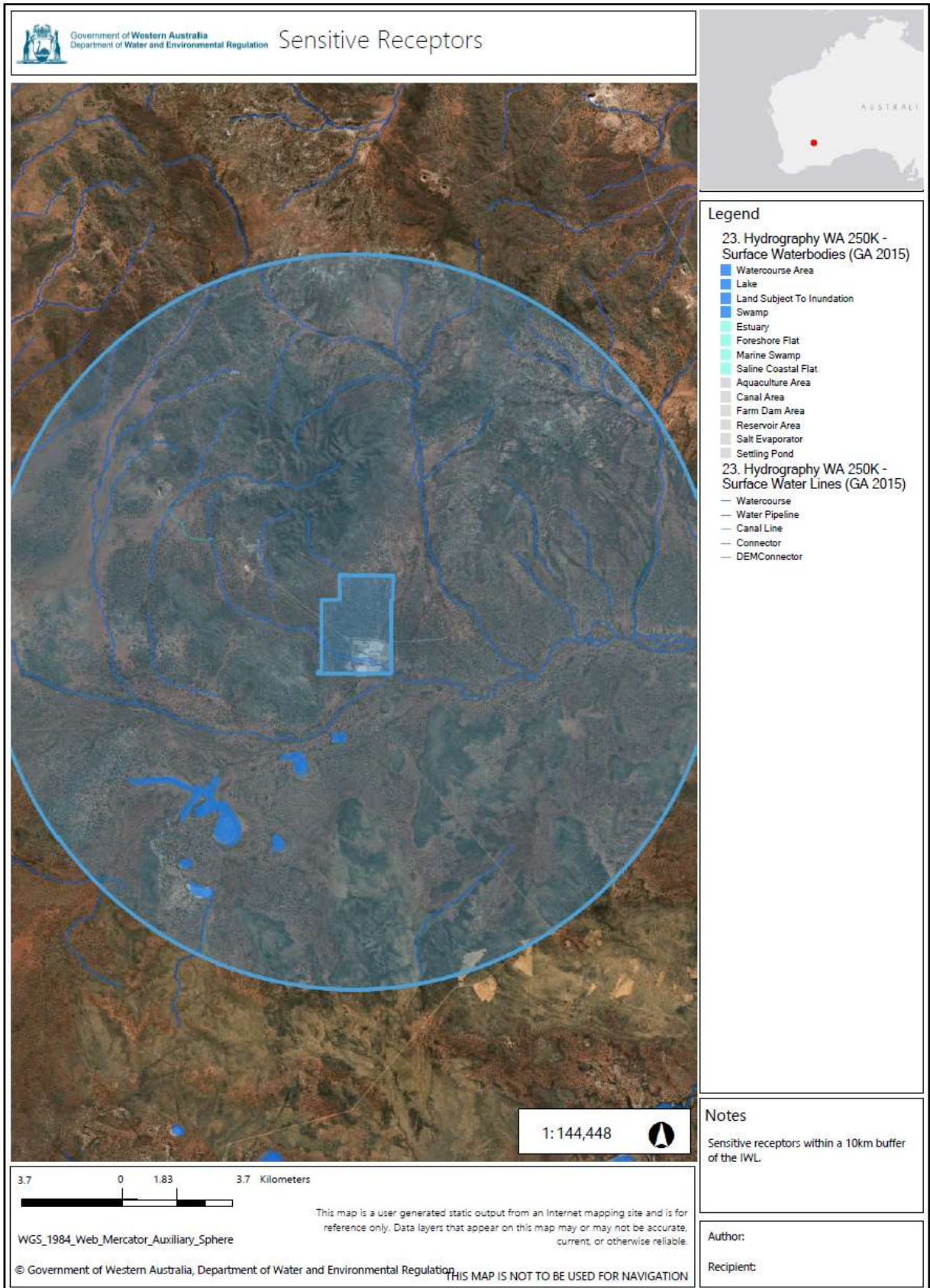


Figure 2: Sensitive receptors within 10km of TSF

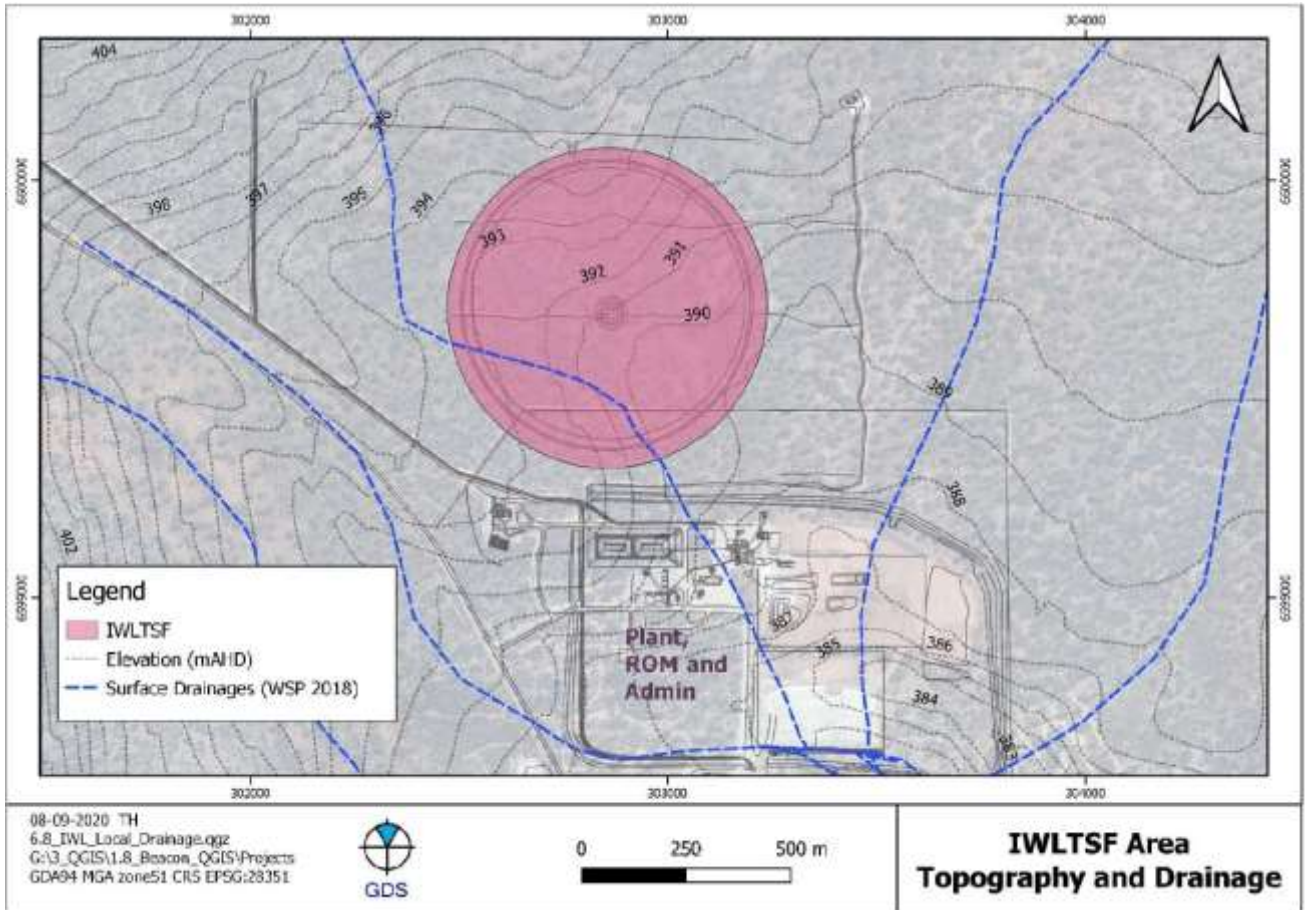


Figure 3: Surface water drainage lines

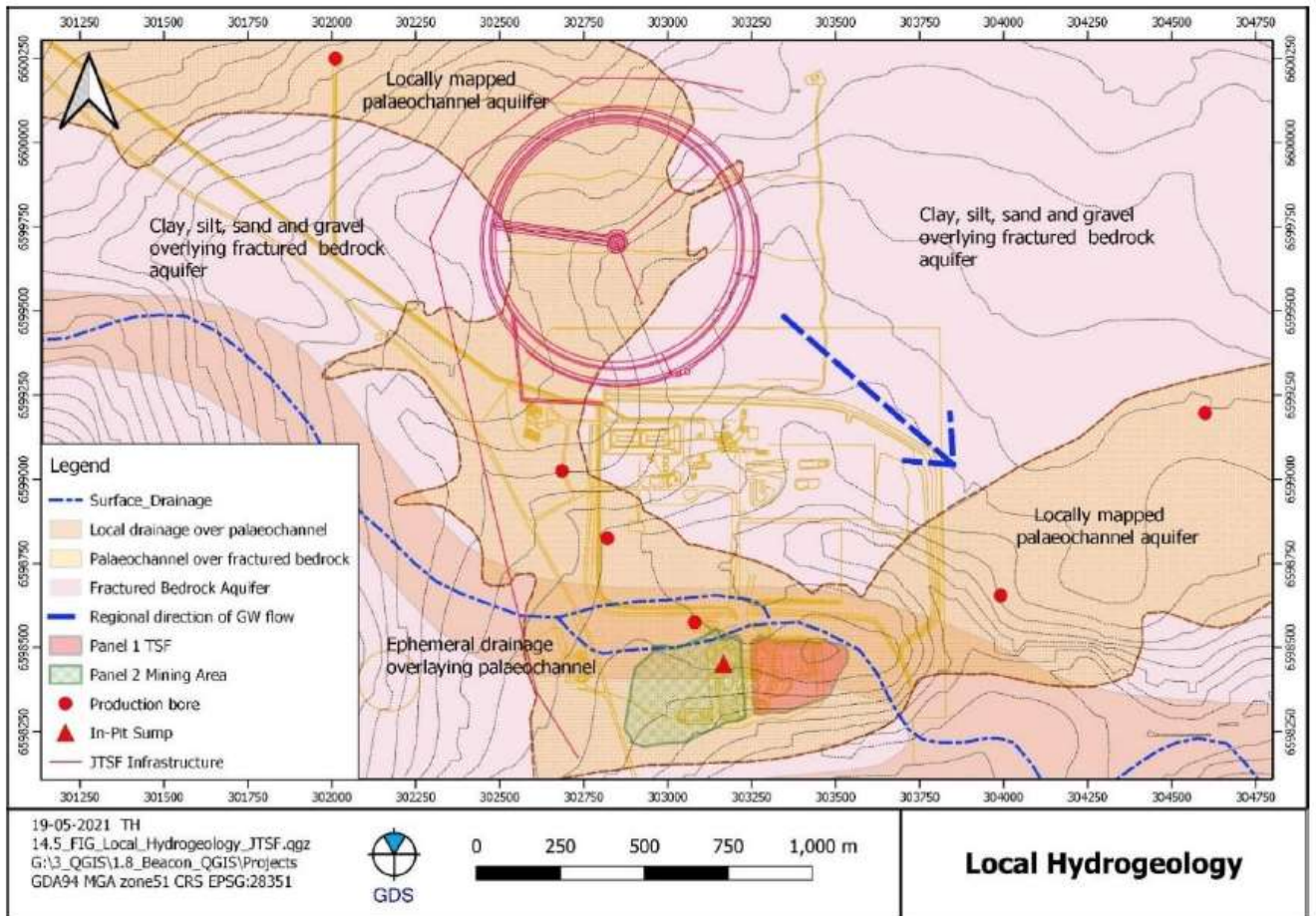


Figure 4: Conceptual hydrogeology

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for each identified emission source 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 applicant 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 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 3.

Works Approval W6488 that accompanies this Decision Report authorises construction and time-limited operations. The conditions in the issued Works Approval, as outlined in Table 3 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. Category 5 activity: discharge of tailings into the integrated waste landform. 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 3: Risk assessment of potential emissions and discharges from the Premises during construction, commissioning and operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Construction								
Construction of TSF	Dust	Air/windborne pathway causing impacts to health of vegetation; and health and amenity of fauna	Vegetation and fauna within the vicinity of the TSF.	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Nil	N/A
	Noise			Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y		
Commissioning								
Commissioning of TSF and associated infrastructure (pipelines, pumps etc..)	Tailings	Direct discharge from spills/leaks causing impacts to health of vegetation and contamination of soil and stormwater	Soil, surface water and vegetation	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk		Standard conditions for design and construction of infrastructure as constructed prior to commissioning: Condition 1 - non-critical infrastructure table and Condition 2 - critical containment infrastructure table. Conditions 3 and 4 - Groundwater monitoring wells. Reporting conditions 5-9 - compliance reporting on the construction of non-critical containment infrastructure and critical containment infrastructure including baseline ambient groundwater monitoring. Standard conditions for	N/A
	Saline water				C = Minor L = Unlikely Medium Risk			

Risk Event					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
							commissioning of Critical Containment Infrastructure and non-Critical Containment Infrastructure: Conditions 10 – 11: infrastructure that may be commissioned. Conditions 12 – 13: commissioning reporting	
Operation (including time-limited-operations operations)								
Discharge of tailings to the TSF	Tailings	Direct discharge from spills/leaks along pipelines causing impacts to health of vegetation and contamination of soil and stormwater. Direct discharge from overtopping of the TSF causing impacts to health of vegetation and contamination of soil and stormwater.	Soil, surface water, fauna and vegetation	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Standard conditions for time limited operations: Conditions 16: Infrastructure table Condition 17: Authorised discharge point Conditions 18 – 19: Monitoring of discharge Conditions 20 - 21 ambient groundwater monitoring	N/A
		Air/windborne pathway causing impacts to health of vegetation; and health and amenity of fauna as tailings dry generating dust.			C = Slight L = Unlikely Low Risk		Nil	
	Leachate	Seepage via soils causing impact to	Vegetation including	Refer to Section 3.1	C = Moderate	Y	<u>Condition 3 – condition for construction of</u>	Refer to Section 3.3

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Risk Event					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		groundwater resulting in groundwater mounding of saline water close to ground surface.	priority flora.		L = Likely High Risk		<p><u>groundwater monitoring bores. The requirements include:</u></p> <p><u>“Well screens must target the part, or parts, of the aquifer most likely to be affected by contamination. Where temporary/seasonal perched features are present, wells must be nested, and the perched features individually screened.”</u></p> <p>Conditions 9 and 20: Standard conditions for monitoring of ambient groundwater conditions before discharge of tailings to assess background levels and ongoing monitoring during operations to assess seepage from TSF.</p> <p><u>Conditions 21 and 22: conditions requiring that bores used for recovery of groundwater or seepage are not used for monitoring and that the bores used for recovery are replaced with monitoring bores in the proximity of the previous monitoring bore.</u></p> <p>Conditions 24 -26: conditions setting the SWL limit proposed by the applicant and the actions proposed in the event of the limit being exceeded.</p>	
		Direct discharge from spills/leaks	Soil, surface water, fauna	Refer to	C = Moderate	Y	Condition 16: Standard	N/A

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Risk Event					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		along pipelines causing impacts to health of vegetation and contamination of soil and stormwater.	and vegetation	Section 3.1	L = Unlikely Medium Risk		infrastructure table	

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

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

3.3 Detailed risk assessment for seepage of leachate from TSF during operation

3.3.1 Leachate emissions

Assessment of the supporting documents in relation to the modeling of seepage and groundwater mounding

The initial modeling for seepage, and consequent management controls, were considered by the DWER to underestimate the level of evaporation from the facility and therefore underestimate the volume of water seeping from the facility. The internal hydrogeological advice regarding the potential for seepage and the management controls proposed by the applicant found that:

- (i) Significant groundwater mounding will take place during the operational life of the facility;
- (ii) Both the height of the groundwater mound, and its radius of influence around the TSF, are likely to have been greatly underestimated by the applicant;
- (iii) The use of recovery bores to manage the effects of groundwater mounding is not considered to be a suitable management strategy for the facility, due to the low hydraulic conductivity of the regolith that underlies the site; and
- (iv) The preferred methods of minimising the effects of groundwater mounding near the TSF are to thicken the tailings before discharge to the facility, and to install drains within the structure to increase the rate of water recovery from the tailings.

In response to the above concerns and others regarding the diversion of surface water in the event of a storm, the applicant upgraded the seepage management infrastructure and surface water diversion controls. In particular they increased the number of monitoring bores that could be converted to recovery bores and provided for a seepage interception trench in the event of the standing water level in the bores reaching 6mbgl. Drains and bunds are also to be installed to divert the surface water from reaching the TSF wall and the current surface water drain between the processing plant and the TSF will be backfilled sufficiently to prevent the potential for it to intercept seepage and divert it into the clean surface water drainage system.

The dewatering of the tailings further before discharge, and the provision of underdrainage to increase seepage recovery, are deemed by the applicant to be unfeasible due to the very fine nature of the tailings particles and the results of flocculant trials in the past. These measures will therefore not be included in the design of the TSF.

The response did not adequately address the flaws found with the water balance and therefore the seepage modelling is still considered to underestimate the seepage from the facility. However, the Delegated Officer considers that the increased seepage monitoring and interception measures should be sufficient to reduce risk to the surrounding environment.

Factors affecting rate of seepage from the facility

Water balance

The TSF seepage rate of 382 m³/day that was used in the seepage modelling was derived from a separate water balance study that included an assumed rate of evaporation based on the pan evaporation rate. The DWER hydrogeological advice is that this assumption is not correct for use in the Goldfields region, where hypersaline groundwater is used in the processing of ore and discharged as tailings to TSFs. The rate of evaporation of hypersaline groundwater in these facilities is much lower than that from freshwater bodies, particularly under conditions when a salt crust forms on the surface of drying tailings. Under these conditions, the rate of evaporation may be less than 20% of measured pan evaporation rates (Newson and Fahey, 2003). This means that either the seepage rate, or the water recovery rate, in such a TSF must be increased to achieve a water balance when evaporation rates are much lower than anticipated.

The tailings from the Jaurdi Gold Processing Plant has a high percentage of water, approximately 65%. The recovery of this from decant is expected to achieve a potential annual average water return of between 53 % and 57 % of the tailings slurry water deposited into the facility.

TSF design (Attachments 1 and 2)

The design of the facility does not include lining or underdrainage. The base of the TSF will not be lined and will only be compacted in the area around the rock ring decant. The prevention of seepage from the facility is therefore reliant on:

- the permeability of the natural ground and the permeability of the tailings after deposition to reduce vertical seepage. The permeability of the ground the TSF is to be constructed on is averaged to be a factor of 10^{-8} m/s and the deposited tailings to be 10^{-9} m/s. This is expected to be sufficiently low to reduce the vertical seepage without the use of liners or compacting of the in-situ clay surface.
- The permeability of the walls as constructed and the presence of a cut off trench to, nominally, 1.5m mbgl to reduce horizontal seepage loss.
- The use of a rock ring decant to filter the water such that it is clear enough to be pumped straight to the processing plant and be used more readily in processing. This reduces the excess water load in the TSF allowing for more rapid settling and less water available for seepage.

The water return system is key to achieving a higher in-situ tailings dry density within the TSF. The minimum capacity of the water recovery system should be not less than 90 tph including the additional capacity to recover water from design storm events.

Seepage monitoring and recovery measures

Monitoring of the groundwater expected to be impacted by seepage from the TSF is through a monitoring borefield as shown in Attachment 4. The bores installed in this borefield are to be designed such that they may be converted to pumping bores in the event that the trigger proposed by the applicant (7mbgl) is exceeded. The pumping of the groundwater to lower the standing water levels is for the protection of the surrounding vegetation as the seepage water is saline to hypersaline and would impact the health of the vegetation if it reaches the root zone.

The use of a monitoring bore for pumping renders the bore inadequate for continued monitoring as the drawdown in the bore makes assessment of the SWL for that area uncertain. To address this, conditions have been included in the works approval that specify a bore being used for pumping can no longer be used for monitoring, and that it must be replaced by another monitoring bore in the vicinity of the pumped bore.

Another contingency action in the event of the SWL trigger being exceeded is that a seepage interception trench of approximately 2m deep and fitted with a sump be installed along the south eastern side of the TSF. This is the area that is estimated to be downstream of the TSF in terms of groundwater flow and should allow for interception and recovery of mounded groundwater or seepage to limit the area of impact on the surrounding environment.

These actions are included in the works approval as there is provision for the TSF to be operated for up to 180 days after the works approval holder has been notified that the Critical Containment Infrastructure Report meets the requirements conditioned in the works approval. Although it is not anticipated that any groundwater mounding will exceed the limit proposed by the applicant within the 180 days of operation, the precautionary principal has been applied, and in accordance with the *Guideline Risk Assessments* (DWER 2017) applicant controls will be conditioned where they lower the risk event.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website (15/01/2021)	None received	N/A
Local Government Authority advised of proposal (15/01/2021)	There appear to be no public health implications nor does it impact on the Shire's wastewater or landfill infrastructure.	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (15/01/2021)	DMIRS replied on 21/04/2021 advising that the submitted mining proposal for the tailings storage facility required resubmission. DMIRS later confirmed resubmission of the mining proposal was provided on 31/05/2021.	The mining proposal was not at variance with the information provided for the works approval.
Applicant was provided with draft documents on 30/06/2021	Minor typographical/formatting errors corrected, and updated Figure 1 for Decision Report provided.	Corrections made to final documents and updated Figure 1 included in Decision Report.

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) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Newson, T.A. and Fahey, M., 2003. Measurement of evaporation from saline tailings storages. *Engineering Geology*, **70**, 217-233.
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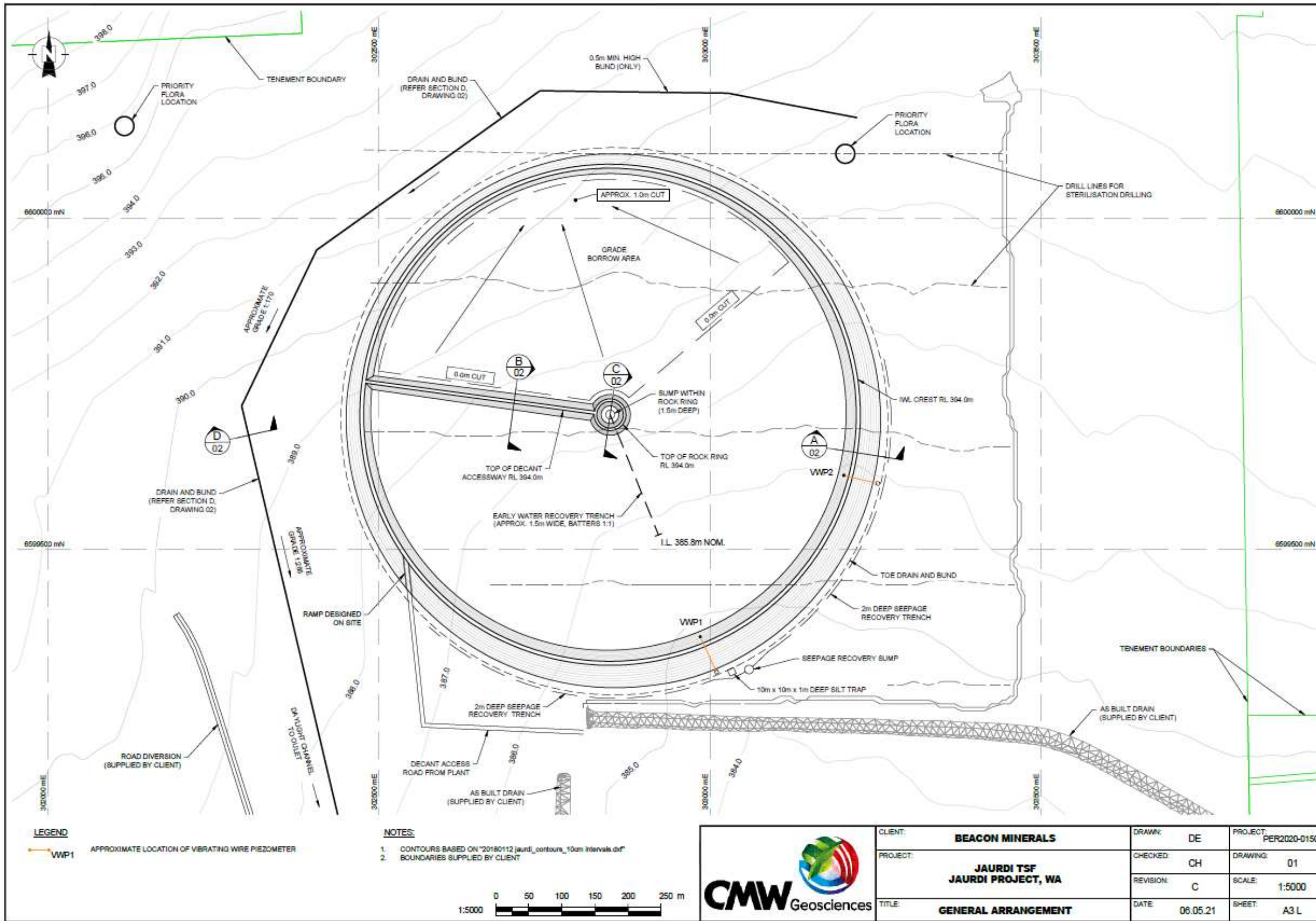
Appendix 2: Application validation summary

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 type="checkbox"/>
Date application received	14/12/2020			
Applicant and Premises details				
Applicant name/s (full legal name/s)	Beacon Mining Pty Ltd			
Premises name	Jaurdi Gold Project TSF			
Premises location	Mining Tenement M16/529			
Local Government Authority	Shire of Coolgardie			
Application documents				
HPCM file reference number:	DER2020/000654			
Key application documents (additional to application form):	<ul style="list-style-type: none"> Siting map Jaurdi Gold Project integrated waste landform: application supporting document Integrated waste landform tailings storage facility: Design report, CMY Geosciences Pty Ltd (July 2020) Jaurdi Project tailings geochemical assessment, Graeme Campbell and Associates(2017) Jaurdi Hills Level 2 flora and vegetation survey Pt 1 (version2), Native Vegetation Solutions (August 2017) Reconnaissance flora and vegetation survey of the Jaurdi Gold Project (M16/529) – May 2020, Native Vegetation 			

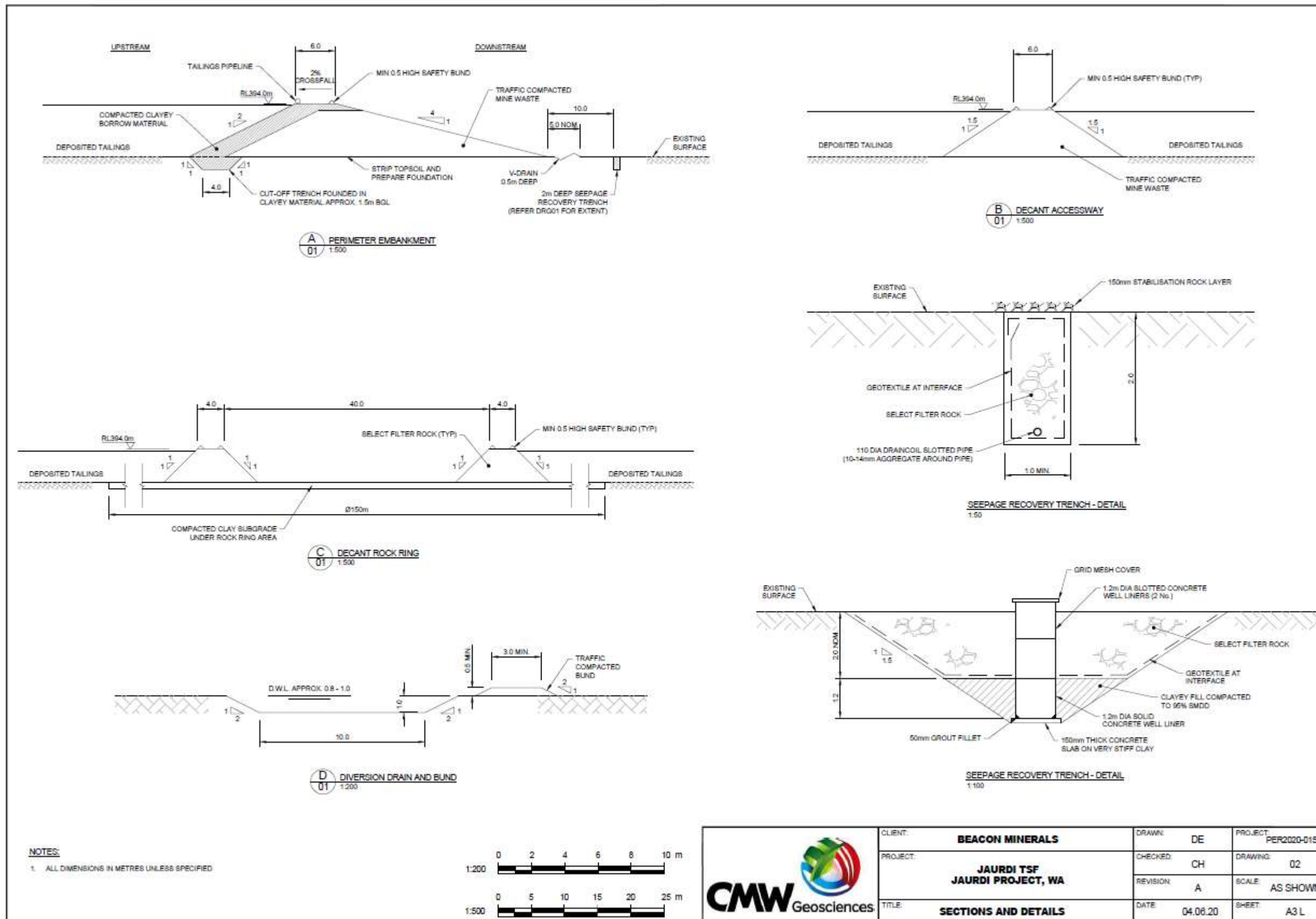
	<p>Solutions (July 2020)</p> <ul style="list-style-type: none"> Level 1 vertebrate fauna risk assessment for the Jaurdi Hills mining area, Terrestrial Ecosystems (August 2017) Vertebrate fauna assessment : Jaurdi Gold Project (M16/529), Terrestrial Ecosystems (June 2020) Targeted survey for malleefowl – Jaurdi Gold Project, Terrestrial Ecosystems (November 2020) Targeted survey for arid bronze azure butterfly – Jaurdi Gold Project, Terrestrial Ecosystems (November 2020) Stakeholder consultation register Hydrological analyses for Jaurdi Gold Project site plan water diversion drains, WSP (February 2018) Integrated waste landform tailings storage facility seepage study, Groundwater Development Services (Pty Ltd) (September 2020) 	
Scope of application/assessment		
Summary of proposed activities or changes to existing operations.	Construction of tailings storage facility.	
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 or non-metallic ore	600,000 tonnes per annual period	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 checked="" 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 type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	Approval: Expiry date: If N/A explain why? Mining tenement

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 No clearing under the CAWS Act is proposed.
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"/>	Licence/permit No: GWL201802(3) Expiry 10/12/2029
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 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: Swan Avon / 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 WQPN 25)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
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>)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<i>Mining Act 1978</i>
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	. Classification: N/A Date of classification: N/A

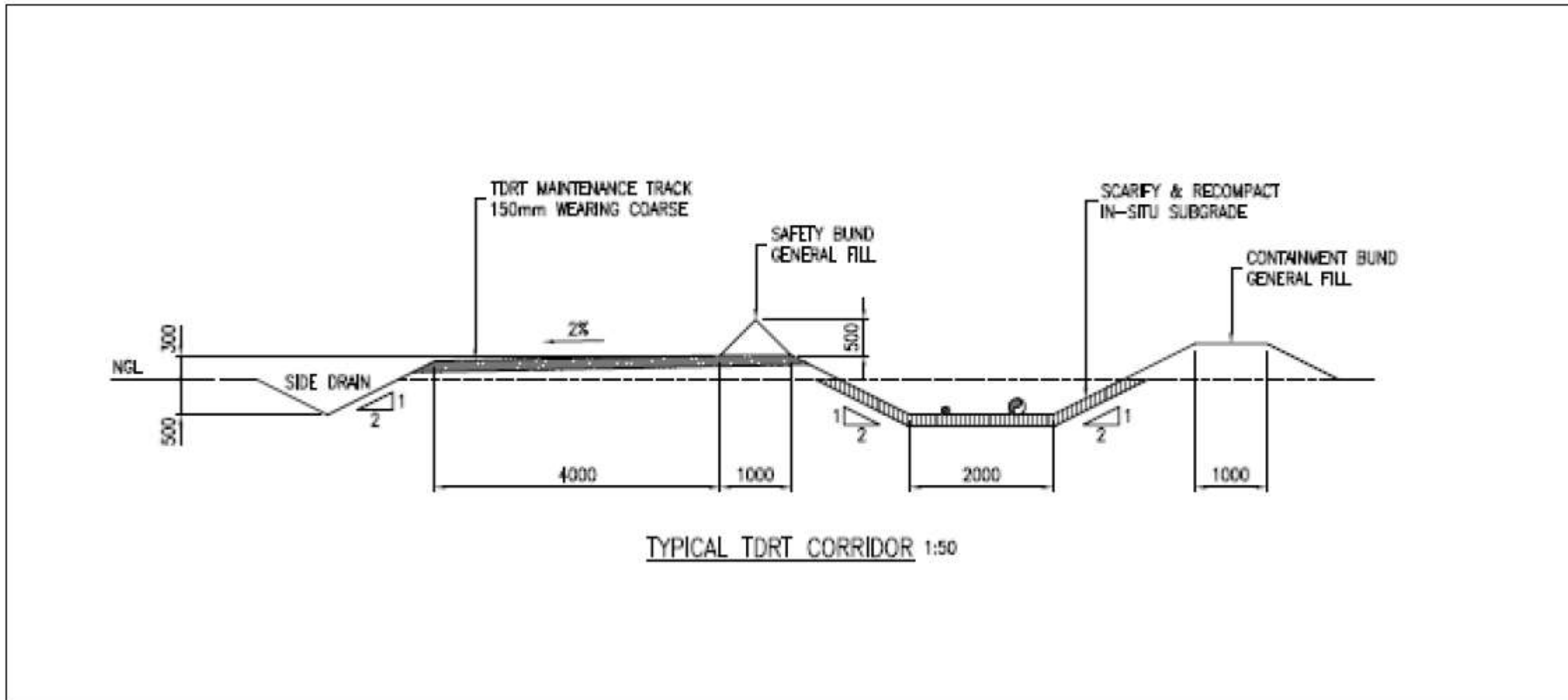
Attachments



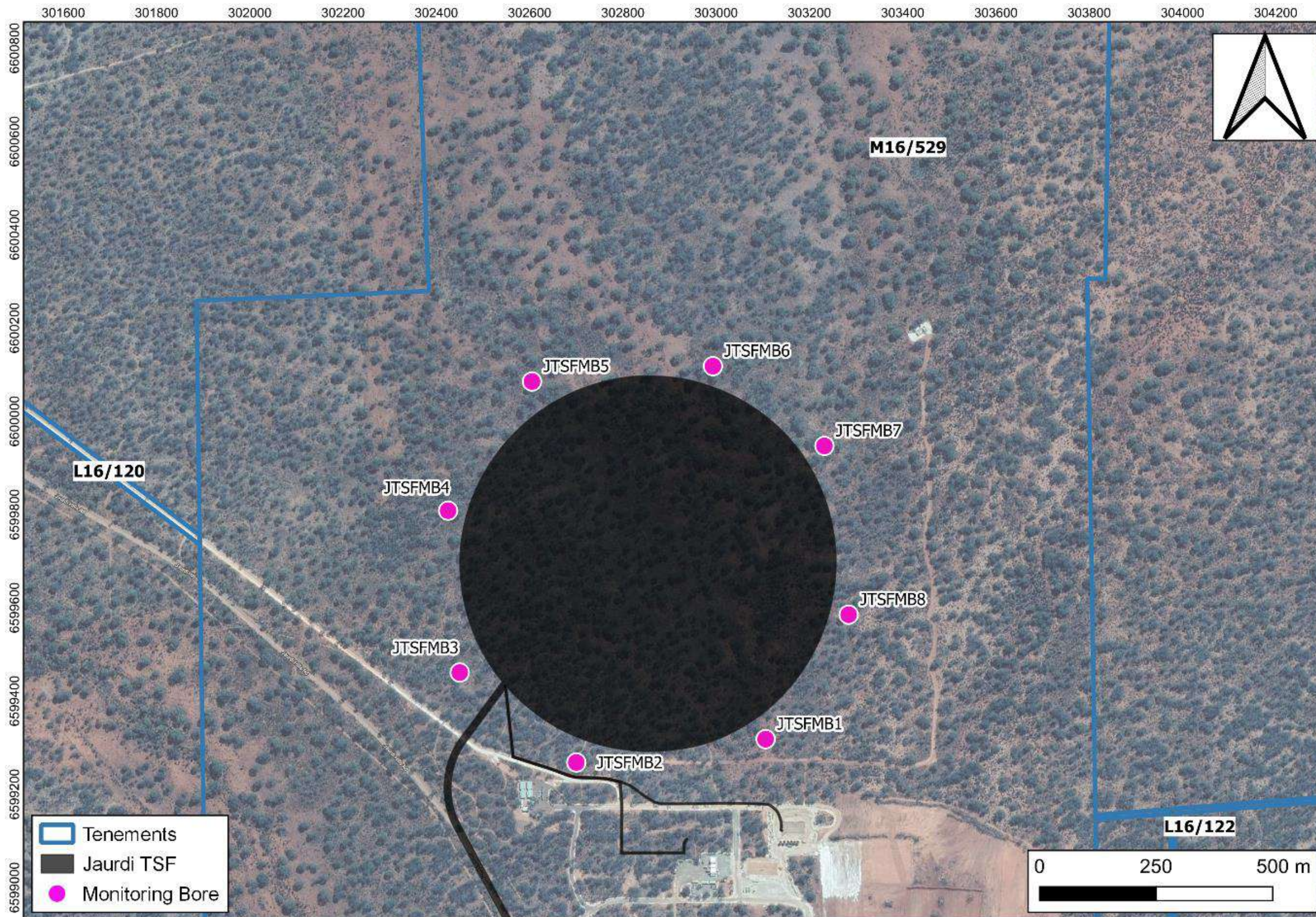
Attachment 1: General arrangement of tailings storage facility



Attachment 2: Details of construction



Attachment 3: Tailings delivery and return water pipeline corridor design



Attachment 4: Jaurdi TSF monitoring bores



Legend

- Site infrastructure
- Tenements
- Existing drains
- Proposed development
- Proposed diversions
- Proposed diversion chainage (m)
- Proposed levees
- Proposed levee chainage (m)
- Proposed crossings

Data source:
 Infrastructure, imagery, topography, tenements - Beacon
 Diversions, levees - Hydrologia

Location

250K map sheet location

N

0.25 0.5 0.75 Km

Project: Jaurdi Gold Project Surface Water Assessment: J0100038

Figure 5
Proposed Diversion Drain Concept

COMPILED: Hydrologia	DATE: 26/05/2021	LOCON: PERTH	A3	SCALE: 1:11 000
GDA 1994 MGA Zone 51		PLAN No: J0100038 Fig 05.pdf		
DOCUMENT NAME: J0100038_Map 05.qgz				

Attachment 5: Proposed surface water diversion channels