Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Works Approval Number	W6195/2018/1
Works Approval Holder	Egan Street Rothsay Pty Ltd
ACN	151 137 450
File Number:	DER2018/001576
Premises	Rothsay Gold Project Mining tenements M59/39 and M59/40 PERENJORI WA 6620
Date of Amendment	**24 July 2020**
Decision	**Revised works approval granted**

1. Definitions and interpretation

Definitions

In this Amendment Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
Amendment Report	refers to this document
Applicant	Greenmount Resources Pty Ltd
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
cfu/100 mL	colony-forming units per 100 millilitres
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Existing Works Approval	The Works Approval issued under Part V, Division 3 of the EP Act and in force prior to this amendment
HDPE	high density polyethylene
m^3	cubic metres
mg/L	milligrams per litre
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)

Term	Definition
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Amendment Report applies, as specified at the front of this Amendment Report.
Review	this Works Approval review
Revised Works Approval	the amended Works Approval issued under Part V, Division 3 of the EP act following the finalisation of this Review
Risk Event	as described in *Guidance Statement: Risk Assessment*
Works Approval Holder	Egan Street Rothsay Pty Ltd
WWTP	Waste Water Treatment Plant

2. Amendment Description

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Works Approval issued under the EP Act for a prescribed premises as set out below.

The following guidance statements have informed the decision made on this amendment:

- *Guidance Statement: Regulatory Principles* (July 2015)
- *Guidance Statement: Setting Conditions* (October 2015)
- *Guidance Statement: Decision Making* (June 2019)

Purpose and scope of assessment

On 3 March 2020, Egan Street Rothsay Pty Ltd (Applicant) submitted an application to the Department of Water and Environmental Regulation (DWER) to amend the Existing Works Approval (W6195/2018/1) for the Rothsay Gold Project (Premises) issued under the *Environmental Protection Act 1986* (EP Act). The Existing Works Approval authorises the construction of the following infrastructure:

- Ore processing facilities including plant drainage retention pond;
- Mine dewatering with discharge to an ephemeral drainage line and evaporation/infiltration pond;
- Class II putrescible landfill;
- Process water dam;
- Five separate lifts of the tailings storage facility (TSF) embankment; and
- Workshop, refuelling areas, wash-down bays and oily water separator.

The Applicant has now requested changes to the Existing Works Approval which relates to the following:

- Proposed use of the TSF as an alternative location for the disposal of dewatering effluent, including the installation of an evaporator at the TSF;
- Construct Class II putrescible landfills at the Woodley's mined pits and increase the annual throughput;
- The installation and construction of a waste water treatment plant and spray irrigation field;
- The Applicant will no longer process ore at the Premises with all mined ore to be transported to the nearby Deflector Gold Mine for processing. As a result, the Applicant will no longer require approval under the Revised Works Approval to construct the processing facilities, cyanide storage tank and process water dam; and
- The Applicant has also advised that only one lift of the embankment walls at the TSF, as approved under the Existing Works Approval, will now be required in the Revised Works Approval. The Existing Works Approval authorised a total of five lifts to the TSF embankments.

No other changes to aspects of the Existing Works Approval have been requested by the Works Approval Holder.

This assessment has resulted in DWER issuing a Revised Works Approval W6195/2018/1 (Revised Works Approval) which is contained in Attachment 1.

3. Overview of Premises

3.1. Operational aspects

Dewatering disposal to the TSF

The Applicant proposes to utilise the existing TSF for the temporary storage of mine dewatering effluent which will enable evaporation loss of some of the water and for suspended solids to settle.

The historical TSF utilises a valley setting by being situated between gently sloping hillsides which form the north and south boundaries with an earthen dam wall constructed at the most south eastern portion to enclose the facility (see Figure 1). The tailings basin slopes downwards from the northwest to the southeast at an average incline of 1.5 %. Tailings material was last deposited into the TSF in the early 1990's.

The mine dewatering effluent pumped from the underground mine will be discharged at the northern end of the TSF. The water will then flow in a south easterly direction across the surface of the TSF before being captured within a purpose built storage pond on the surface of the TSF adjacent to the embankment.

The storage pond will consist of an excavation within the historical tailings material to a depth of approximately three metres. The dimensions of the pond are approximately 100 m x 100 m and will consist of a decant tower and causeway for the recovery of dewatering effluent (see Figure 1 below). The storage pond is expected to have a storage capacity of 22,288m^3.

Figure 1: TSF mine dewatering discharge area

The maximum storage of the TSF, including the capacity of the proposed operational storage pond, is calculated as 88,530 m^3. However, the Applicant will only store operational water within the excavated storage pond.

A minimum freeboard of 500mm will be maintained, following a 1 in 100 year ARI, 72 hour rainfall event, as shown in Figure 2 below.

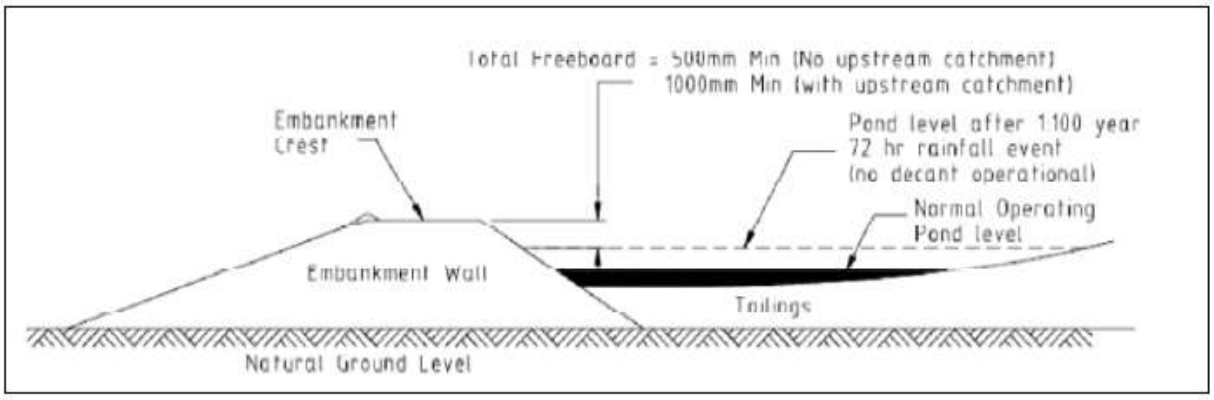

Figure 2: Freeboard of TSF Operational Pond

The decant which is accessed from the main embankment will operate automatically to capture stored water and will pump the water to:

- header tanks for reuse underground or to standpipes for dust suppression;
- an evaporation/infiltration pond for disposal; and
- a mechanical evaporator which will be located on the TSF embankment.

The decant consists of a 1.2 m diameter slotted concrete tower installed on concrete footings and is located at the centre of the causeway. The concrete tower has two submersible pumps with float control switches mounted on a lifting hoist within the tower.

Flow metres will be installed to determine the volumes of water discharged to the TSF from the underground, to the evaporator, to the evaporation/infiltration pond and to the header tanks.

The TSF consists of five groundwater monitoring bores and one piezometer which have already been installed under the Existing Works Approval. The groundwater monitoring bores were strategically placed to monitor for potential impacts from the use of the TSF for storage of tailings material, however they will now monitor for impacts from the storage of dewatering effluent.

The Existing Works Approval allows for an initial dewatering discharge rate of 233,000 kilolitres (KL) from the underground mine with the discharge to an onsite ephemeral creek for a period of four months. Following the initial discharge period, the Applicant then estimates up to 213,000 KL will be discharges to the TSF for a period of eight months during the mine construction phase, then up to 505,000 KL per year during normal operations.

Installation of evaporators at the TSF

The Applicant proposes to install an evaporator on the TSF to increase the evaporation rate of the dewatering effluent. The evaporator will be positioned on the decant causeway to minimise overspray impacts outside the TSF footprint.

The mechanical evaporator will consist of a 400/200 Minetek mechanical evaporator capable of pumping 25 l/sec, and will be connected to the TSF decant tower via a poly pipeline.

Alternative location of the Class II Putrescible landfill and increase the design capacity

The ground conditions at the proposed Class II putrescible landfill approved under the Existing Works Approval were found to be unsuitable. Therefore the Applicant will now relocate the proposed Class II putrescible to the Woodley's North and South Pits. The pits were historically used by the previous owners of the Premises for the burial of construction and demolition wastes.

The capacity of the Class II putrescible landfill will be increased from 250 tonnes per annum (tpa) up to 500 tpa. The method of construction and operation will remain the same as assessed under the Existing Works Approval.

Waste water treatment plant

The Applicant will construct a waste water treatment plant (WWTP) to treat up to 25 m^3/day of wastewater generated at the accommodation camp and office/crib ablutions. The treatment of up to 25 m^3/day of waste water exceeds the minimum throughput of 20 m^3/day when a works approval is required for construction.

The WWTP will consist of an active biological treatment process utilising a Submerged Aerated Filter (SAF). The infrastructure and equipment will be located within a bunded modified sea container. The SAF will consist of the following infrastructure for the treatment of wastewater generated at the accommodation camp and office/crib ablutions:

- Wastewater will pass through a screen before gravity feed to a bio-zone tank and aerated bio-filter;
- The biologically treated liquors will then be discharged to a settling tank;
- Sludge will be settled in the sludge holding tank via a tube settler. Bio-solids from the sludge tank will be pumped out when required and sent to a licensed facility for burial;
- Effluent from the sludge holding tank will be discharged to a chlorine tank for disinfection by sodium hypochlorite dosing.

Treated effluent from the SAF will be discharged to land via a surface irrigation spray-field.

The spray field will consist of four sprinkler areas within a designated fenced compound which has a combined surface area of 0.81 ha. The discharge pipeline from the holding tank to the spray field will be installed alongside the access road.

The WWTP is designed to produce treated effluent to the following specifications in Table 2:

Table 2: effluent quality

Description	Value
Nitrogen	<36 mg/L
Phosphorus	<9 mg/L
Biochemical Oxygen Demand (BOD)	<20 mg/L
Total Suspended Solids (TSS)	<30 mg/L
Chlorine Residual	0.2-2.0 mg/L
pH	6.5 – 8.5
E.coli	<1,000 cfu/100ml

The Applicant will undertake sampling of the effluent on a monthly basis and will compare the results of the sampling with the manufacturer's specifications (as above) to assess the ongoing performance of the WWTP.

4. Amendment history

There are no previous approvals for this project.

5. Location and receptors

Table 3 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 3: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Not applicable	No nearby sensitive premises

Table 4 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 4: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises	Potential receptor status
Groundwater	Depth to groundwater encountered at approximately 11 – 55 m below ground level (mbgl) and quality is classed as brackish at approximately 6,000 mg/L Total Dissolved Solids. Depth to groundwater at the TSF approximately 50 mbgl.	Not considered a sensitive receptor due to distance
Surface water	There is no permanent surface water in the project area. The project area is not within a surface water management area. Very low stream gradients and high evaporation rates result in sheet flow into numerous ephemeral drainage lines however these do not reach the Lake Monger system in most years. The Lake Monger system is located 11 km away.	Not considered a sensitive receptor due to distance
Threatened/Priority Flora	No nearby Threatened/Priority Flora recorded.	Not considered a sensitive receptor due to distance

6. Risk assessment

Tables 5 and 6 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 5: Risk assessment for proposed amendments during construction

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Construction, mobilisation and positioning of infrastructure	Construction activities at the TSF by installing decant tower and causeway, installing evaporator and minor earth works to the embankment wall to flatten out, construct bunds and spillway. Construction and installation of WWTP infrastructure and spray irrigation field. Construction of an additional Class II landfill at Woodley's Pit.	Noise	No residences or other sensitive receptors in proximity		None	No	No receptor present
		Dust	Surrounding vegetation	Air / wind dispersion	Smothering of nearby vegetation resulting in a decline in vegetation health.	No	Short duration for construction works. Use of water carts to wet down roads and exposed surfaces. No works to be carried out during periods of high winds. The provisions of the *Environmental Protection Act 1986* regarding environmental harm apply.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017)

Table 6: Risk assessment for proposed amendments during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Dewatering	Use of the historical TSF for the temporary storage of dewatering effluent.	Discharge of historical tails that have become dispersive within the stored dewatering effluent Seepage	Surrounding soil fauna and vegetation Groundwater Groundwater dependent ecosystems	Seepage through soil	Soil contamination with harmful dissolved chemicals inhibiting vegetation growth and survival of soil fauna.	Yes	Refer to section 6.4 – Risk Event Temporary storage of dewatering effluent at a historical TSF
		Overtopping of embankment wall	Surrounding soils and vegetation	Direct discharge	Soil contamination with harmful dissolved chemicals inhibiting vegetation growth and survival of soil fauna.	No	The TSF will been redesigned so a minimum freeboard of 500 mm is maintained following a 100 year Average Return Interval (ARI) 72 hour rainfall event. The freeboard will be inspected daily to ensure integrity. A spillway will be included to manage any extreme events and will report to a minor drainage path near the TSF. Daily inspections of the decant pond will be undertaken to check the size and location. Daily visual inspections will also monitor the dewatering flow rates/volumes are maintained to achieve the designed freeboard. There are no significant flora or fauna species, rivers, lakes or other surface water features on the premises or local vicinity.
		Accidental discharge of dewatering effluent	Surrounding soils and vegetation	Direct discharge	Soil contamination with salts and inundation of root systems resulting in	No	Any accidental discharge of dewatering effluent is only expected to occur for a short period of time, and therefore exposure to inundation with saline water would be

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
		through pipeline failure			a decline in vegetation health.		limited and not expected to have an impact. Results from water sampling (October 2019) indicate salinity levels in the dewatering effluent are not considered high at approximately 2,500 mg/L TDS, and therefore are not expected to have any impacts on vegetation. The recent sampling results indicate the water quality is suitable for stock watering. There are no significant flora or fauna species, rivers, lakes or other surface water features on the premises or local vicinity. Mine dewatering pipelines are constructed with 110mm HDPE and are located within bunded pipeline routes (Existing Works Approval Decision Report, 15 November 2019). Daily visual inspections will be undertaken to monitor the integrity of associated infrastructure.
		Spray drift from evaporators	Surrounding soils and vegetation	Air / wind dispersion	Soil contamination with salts inhibiting vegetation growth. Smothering of nearby vegetation with brackish water resulting in a decline in vegetation health.	No	The evaporator will be located on the decant causeway to limit spray drift outside of the TSF footprint. The prevailing wind direction is from the south which will assist in directing spray drift over the pond. The area outside of the TSF footprint where the decant causeway commences, is highly degraded, with limited to no native vegetation present.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
							Daily inspections of the infrastructure will be undertaken to ensure the performance meets the design specifications. The evaporator will not be used during high wind events.
New Class II putrescible landfills at the Woodleys North and Woodleys South pits	Use of a disused mine pits for the disposal of 500 tpa of Class II putrescible wastes	Dust	Surrounding vegetation	Air/windborne pathway	Smothering of nearby vegetation resulting in a decline in vegetation health.	No	The occasional disposal of waste is not expected to generate significant dust emissions. The mine pits are 9-12 m below ground level therefore minimising exposure to the effects from wind. Applicant will use water cart to wet down roads and exposed surfaces. The provisions of the *Environmental Protection Act 1986* regarding environmental harm apply.
		Contaminated stormwater	Ephemeral drainage line located approximately 100 m away Groundwater greater than 30 m below the base of the mined pits therefore not considered a receptor.	None. Contaminated stormwater will remain within the mined pits	None	No	No pathway present All contaminated stormwater will remain within the confines of the mined pits.
		Wind-blown waste	Surrounding vegetation	Air/windborne pathway	Impacts to amenity	No	Waste will covered at least once per week with waste rock from the underground. The mined pits are 9-12 m below ground level therefore minimising exposure to the effects from wind. Only small scale landfill to service the mine.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
		Leachate	No receptors. Groundwater greater than 30 m from the base of the mined pit.	None	None	No	No receptor present
		Noise	No residences or other sensitive receptors in proximity	Air/windborne pathway	None	No	No receptor present
Waste Water Treatment Plant	Treatment of up to 25 m^3 of sewage through a Submerged Aerated Filter (SAF) process located within a sea container. Treated sewage is irrigated to land via a sprinkler system	Odour	No residences or other sensitive receptors in proximity	Air / wind dispersion	None	No	No receptor present
		Rupture of pipes / overtopping of holding tanks resulting in sewage discharge to land	Surrounding soils and vegetation The separation distance to the ephemeral drainage line is too great to be considered a receptor.	Direct discharge Sheet flow	Soil contamination with nutrients inhibiting vegetation growth and survival	No	All sewage pipelines will be located within earthen bunding to contain leaks and will be inspected on a regular basis. Sewage treatment tank located within a bunded sea container to capture any spills. No nearby threatened or priority flora. Any increase in soil nutrients due to accidental discharge is not expected to have an impact on nearby vegetation as it will be temporary in nature.
		Discharge of treated wastewater to the irrigation field that exceeds anticipated quality	Vegetation	Direct discharge	Impacts to the health of native vegetation through increased nutrients in the soil and water logging.	Yes	Refer to section 6.5 – Risk Event Disposal of treated effluent to land

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017)

6.1 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 7 below.

Table 7: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 8 below.

Table 8: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		**The following criteria has been used to determine the consequences of a Risk Event occurring:**		
			Environment	**Public health* and amenity (such as air and water quality, noise, and odour)**
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity

Likelihood	
The following criteria has been used to determine the likelihood of the Risk Event occurring.	
Almost Certain	The risk event is expected to occur in most circumstances
Unlikely	The risk event will probably not occur in most circumstances
Rare	The risk event may only occur in exceptional circumstances

Consequence		
The following criteria has been used to determine the consequences of a Risk Event occurring:		
	Environment	**Public health* and amenity (such as air and water quality, noise, and odour)**
Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*

"onsite**"** means within the Prescribed Premises boundary.

6.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 9 below:

Table 9: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

6.4 Risk Event 1 – Temporary storage of dewatering effluent at a historical TSF

6.4.1 Description of temporary storage of dewatering effluent at the TSF

The Applicant proposes to utilise the existing TSF for the temporary storage of mine dewatering effluent which will enable evaporation loss of some of the water and for suspended solids to settle. The stored dewatering effluent will then be pumped to either an evaporator located at the TSF, to an infiltration/evaporation pond for disposal to land and header tanks for re-use underground and for dust suppression at the Premises.

Dewatering effluent will be discharged at the northern end of the TSF, and will then flow in a south easterly direction across the surface of the TSF before being captured within a purpose built storage pond excavated out of the historical tailings material. The storage pond will be constructed by excavating a three metre deep area on the TSF surface to provide a storage capacity of 22,288 m^3. A purpose built decant tower will collect the storage water for reuse and/or disposal.

6.4.2 Identification and general characterisation of emission

The dewatering effluent to be discharged to the TSF is generated from the dewatering of the underground mine. The existing British Queen Shaft located at the underground mine (mineralization zone) provides a good representation of the dewatering effluent quality. Depth to the water table at this location is 51-55 mbgl with the quality of the water from previous sampling is provided in the table below.

Table 10: British Queen Shaft background groundwater data 2012 – 2019

			British Queen Shaft					ANZECC
Parameter	Unit	LOR	2012	2013	2017	2018	2019	Stockwater
pH value	pH Unit	0.01	7.4	7.51	8.19	7.91	8.10	
Electrical Conductivity @25°C	µS/cm	1	7,600	8300	7720	8330	7910	6000
Total Dissolved Solids@180°C	mg/L	10	5,900	6740	5610	5360	4816	4000
Total Suspended Solids	mg/L	5	-	-	21	<5	8	
Salinity	ppt		-	3.37	-	-	-	
Sulphate as SO_4	mg/L	1	-	434	512	460	215	1000
Total acidity ($CaCO_3$)	mg/L		-	2680	-	-	175	
Aluminium	mg/L	0.01	-	-	0.03	<0.01	0.04	5.0
Arsenic	mg/L	0.001	<0.03	0.009	0.014	0.014	0.01	0.5
Cadmium	mg/L	0.0001	<0.002	0.0002	0.0002	0.0002	0.0001	0.1
Chromium	mg/L	<0.001	<0.005	0.002	<0.001	<0.001	0.002	1.0
Copper	mg/L		-	0.004	-	0.013	0.012	
Lead	mg/L	<0.001	-	<0.001	<0.001	<0.001	<0.001	0.1
Manganese	mg/L	0.001	-	-	0.137	0.170	0.041	
Mercury	mg/L		-	-	-	-	-	
Nickel	mg/L		-	0.022	-	-	-	
Nitrate-Nitrogen	mg/L		-	-	-	0.17	2.86	
Selenium	mg/L	0.01	-	0.02	<0.01	<0.01	<0.01	0.02
Strontium	mg/L	0.001	-	-	1.00	1.02	0.473	-
Sulphate	mg/L		-	434	-	-	-	
Zinc	mg/L	0.005	-	0.099	0.263	0.034	0.056	20
Iron	mg/L	0.05	-	1.27	<0.05	<0.05	0.11	
Barium	mg/L	0.001	-		0.064	0.066	0.032	
Mercury (Dissolved)	mg/L	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	0.002
Fluoride	mg/L	0.1	-	0.2	0.1	0.2	0.2	2
WAD Cyanide	mg/L	0.002	-	-	-	-	0.005	

Note: Where more than one full suite of water quality data was collected in a year, the highest value from the samples taken that year is shown in the table for each parameter sampled

Groundwater quality from the British Queen Shaft appears to have been impacted from historical

mining at the Premises. The water is brackish with a TDS of approximately 5,000 mg/L (when compared to other bores in the vicinity of the project, the TDS of these range from 1,060 – 2,930 mg/L). Magnesium, chloride and sulfate concentrations are also elevated within the British Queen Shaft, when compared to other nearby groundwater monitoring bores.

As approved through the Existing Works Approval, the Applicant will initially dewater 230,000 kL from the underground workings over a period of four months with discharge to an ephemeral drainage line. Following the initial dewatering of the underground workings, the Applicant will then continually dewater between 300-500,000 kL per annum during mining operations with the discharge to the TSF for temporary storage. Mining operations are expected to last for a period of 5 years.

6.4.3 Description of potential adverse impact from the emission

Potential structural problems associated with the storage of dewatering effluent

Utilising a historical TSF for the storage of mine dewatering effluent can cause the tailings material to become dispersive and structurally weak. This then could lead to issues of piping failure (tunnel erosion) near the corners of the pond, and the discharge of stored water and potentially harmful dissolved constituents to the walls of the TSF and into the environment (Appleyard, 2020). This risk is considered to be significant at the site for the following reasons:

- The tailings are likely to have a large content of entrained soluble salts and high exchangeable sodium percentage (ESP) values, and could become highly dispersive on wetting; and
- The dewatering effluent has a relatively low salinity (<3000 mg/L) with a high sodium adsorption ratio (SAR) value which could increase the dispersivity of tailings materials which are already likely to be sodic and potentially unstable.

Potential for seepage taking place from the base of the TSF

Preliminary modelling of the impacts of water storage on the TSF on the phreatic surface within the facility was undertaken by Groundwater Resource Management on behalf of the applicant (Appendix G of the Works Approval application report). This indicated that a groundwater mound could extend up to 1.8 km from TSF with the ongoing discharge of dewatering effluent to the facility.

This means that, although it is unlikely that seepage from the TSF would affect groundwater in fractured rock aquifers beneath the site due to their depth and the low permeability of the overlying regolith, there is a risk that a shallow perched aquifer could form near the TSF. Such a perched aquifer could provide a pathway that could transport seepage and potentially harmful dissolved chemical constituents to vegetation and soil fauna near the TSF (Appleyard, 2020). The closest groundwater bores for stock watering purposes are located 3 to 4 km downstream of the Premises, however this distance is considered too great for the bores to be considered as receptors.

Flow modelling was also undertaken on the evaporation/infiltration pond (East Pond) which is located approximately 1.0km northeast of the TSF. The modelling indicates the extent of the lateral mounding after 6 years of operations (at the highest infiltration rate) is estimated to reach up to 1.3 to 1.4 km from the facility and at this distance may combine with the lateral seepage from the TSF. Seepage from the East Pond is not expected to present at ground level with the highest surface water level of 2 mbgl expected near the west embankment of the East Pond. Seepage from the TSF may present at ground level within 12 months however this is near the base of the TSF and is not expected to be influenced from the East Pond seepage located over 1 km away.

6.4.4 Criteria for assessment

Relevant land and groundwater quality criteria include ANZECC/ARMCANZ guidelines for livestock watering and fresh waters, and ASC NEPM for soils and groundwater.

6.4.5 Applicant controls

Inspections will conducted once per 12 hour shift to monitor the water storage pond, the freeboard of 500 mm is being maintained and all infrastructure is functioning correctly.

Minor earth works will be made to the TSF embankment wall to flatten out, construct bunds and a 10 m wide spillway. The TSF will be designed to hold a 100 yr ARI 72 hr rainfall. The spillway is designed for use during extreme rainfall events to prevent large scale overtopping of the embankment.

Use of a decant tower to recover stored water before being pumped to an evaporator located at the TSF, to the infiltration/evaporation pond for disposal and to header tanks for reuse at the Premises.

Discharge of the dewatering effluent at the northern end of the TSF before the material flows towards the storage pond will also assist in evaporation loss.

6.4.6 Key findings

The Delegated Officer has reviewed the information regarding the temporary storage of dewatering effluent at a historical TSF and has found:

1. *The historical TSF has not been operational for nearly 30 years.*
2. *Groundwater at the TSF location is suitable for stock watering purposes, however the distance to the groundwater is 50 - 55 mbgl and therefore makes it unlikely that any potential seepage will reach the groundwater.*
3. *There is a risk that the discharge of groundwater with relatively low salinity into potentially sodic tailings could make these materials dispersive and structurally weak. As this could lead to tunnel erosion and the discharge of ponded water to the environment, the dispersion potential of the tailings materials in the ponded area should be tested before water ponding commences. This is necessary to ensure that suitable management measures are implemented to prevent the structural failure of the pond. Suitable management measures include applying gypsum to the pond walls and floor, and undertaking compacting works to the walls and floor.*
4. *There is a risk that the ongoing discharge of water to the storage area on the TSF could create a perched aquifer in the regolith near the facility. Such an aquifer would be a potential pathway for transporting dissolved chemical constituents at concentrations of environmental concern to nearby vegetation and soil fauna. Preliminary modelling indicates that a groundwater mound could extend up to 1.8 km from the TSF after 6 years. This risk could be managed by ensuring that a suitable cut-off drain is constructed around the TSF, and that captured water is pumped back to the water storage pond.*
5. *There are currently 5 groundwater monitoring bores placed at the TSF to monitor for seepage to groundwater. However, seepage from the base of the TSF is unlikely to impact groundwater with a depth of 50-55 m and the low permeability of the overlying regolith. Therefore an additional shallow monitoring bore should be installed down gradient of the cut-off drain to ensure the perched groundwater is not bypassing the drain.*

The controls proposed by the Applicant are not likely to be sufficient to manage the potential impacts from storing dewatering effluent at the TSF. Therefore the Delegated Officer considers that conditions should be included in the Revised Works Approval.

6.4.7 Consequence

Seepage to groundwater from the storage of dewatering effluent at the TSF is unlikely to occur due to the low permeability of the overlying regolith and the depth to groundwater being 50-55 mbgl. However, this assessment does not consider the effects of the tailings materials becoming dispersive in the stored water causing potentially harmful dissolved constituents to the walls of the TSF and then into the environment which could have mid-level onsite impacts. Additionally, the assessment did not consider that the storage of water in the TSF could create a perched aquifer in the regolith near the facility. Such an aquifer would be a potential pathway for transporting dissolved chemical constituents at concentrations of environmental concern to nearby vegetation and soil fauna. Therefore, the Delegated Officer considers the consequence of the temporary storage of dewatering effluent at a historical TSF to be **Moderate**.

6.4.8 Likelihood of Risk Event

The Delegated Officer has determined that the likelihood of the stored water in the TSF causing a discharge of pond water to the environment occurring at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event 1 to be **Possible**.

6.4.8 Overall rating of temporary storage of dewatering effluent at the TSF

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 7) and determined that the overall rating for the risk of the temporary storage of dewatering effluent at a historical TSF is **Medium**.

6.5 Risk Event 2 – Disposal of treated effluent to land

6.5.1 Description of disposal of treated effluent to land

The Applicant will construct and operate a waste water treatment plant (WWTP) to treat up to 25 m^3/day of wastewater generated at the accommodation camp and office/crib ablutions.

The WWTP will consist of an active biological treatment process utilising a Submerged Aerated Filter (SAF). Treated effluent from the SAF will be discharged to land via a surface irrigation spray-field.

The spray field will consist of four sprinkler areas within a designated fenced compound which has a combined surface area of 0.81 ha. The discharge pipeline from the holding tank to the spray field will be installed alongside the access road.

6.5.2 Identification and general characterisation of emission

The type of emission is direct daily discharge of treated wastewater from the WWTP. The WWTP has a design specification to achieve a 'Class C' rating for the discharged treated effluent. The expected output characteristics of the treated effluent are presented in table 11 below.

Table 11: Wastewater output characteristics:

Description	Value
Total Nitrogen	<36 mg/L
Total Phosphorus	<9 mg/L
Biochemical Oxygen Demand (BOD)	<20 mg/L
Total Suspended Solids (TSS)	<30 mg/L
Chlorine Residual	0.2-2.0 mg/L
pH	6.5 – 8.5
E.coli	<1,000 cfu/100ml

6.5.3 Description of potential adverse impact from the emission

Irrigation of effluent to land may impact the health of native vegetation through increased nutrients in the soil and water logging.

The depth to groundwater at the Premises is approximately 20-24 mbgl and there are no surface water features within 100 m of the WWTP or irrigation area. Therefore these separation distances are considered too great for groundwater or surface water to be considered as receptors when assessing for impacts from the emission.

6.5.4 Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999;
- Australian and New Zealand Environment and Conservation Council (ANZECC) 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, October 2000;
- Code of Practice – Onsite Wastewater Management, Victorian EPA, Publication 891.4, 2016;
- US EPA, Process design manual, land treatment of municipal wastewater effluents, 2006; and
- Australian and New Zealand Environment and Conservation Council (ANZECC) 1997 Australian Guidelines for Sewage systems, Effluent Management, National Water Quality Management Strategy.

The following equation is used to determine the size of the spray irrigation land required to enable the water and its dissolved constituents are taken up by vegetation or retained within the soil profile without excessive seepage into groundwater (US EPA, 2006).

$A = (3.65 \times Q)/ (L \times T_{app})$

Where: A = land area (hectares)
Q = flow rate of wastewater (m^3/day)
L = wastewater hydraulic loading to soil (cm/week)
T_{app} = period of wastewater application each year (weeks)

Notes: The nutrient loading is not considered for this determination.
Wastewater hydraulic loading to soil is estimated as 5cm/week for this area (from AS/NZS 1547: 2012)
Pan evaporation exceeds typical monthly rainfall throughout the whole year (DPIRD).

The estimated irrigation land area required to manage the rate of wastewater discharge has been calculated as follows:
Land area (hectares) = (3.65 x 25) / (5 x 52) = 0.35 hectares.

The size of the proposed spray irrigation land area will be 0.81 hectares (8,100 m^2) which is over double the minimum area recommended.

Loading rates to avoid water logging

To avoid water logging, the Victorian EPA (2016) recommends a maximum irrigation rate for wastewater for different soil textures are set out in table 12 below.

Table 12: Irrigation rates for wastewater

Soil Type	Irrigation rates (L/m^2/day)
Sands and gravels	5
Sandy loams	5
Loams	4
Clay loams	3.5
Light clay	3
Medium to heavy clays	2

From AS/NZS 1547: 2012

The maximum irrigation rate in accordance with AS/NZS 1547: 2012 for sandy loams (soil type in this area) to avoid water logging is 5 L/m^2/day. The effluent discharge rate is 2.94 L/m^2/day (25 m^3/day) therefore satisfies this criterion.

Native vegetation maximum nutrient loading rates

The ANZECC (2000) guidelines establishes the STV's (20 years) for Nitrogen and Phosphorus in irrigated treated effluent at 125 mg/L and 12 mg/L respectively, when impacts to native vegetation could occur if concentrations exceed these values. The expected concentration levels for Nitrogen and Phosphorus are <36 mg/L and <9 mg/L respectively and therefore satisfy this criteria.

6.5.5 Applicant controls

The WWTP spray irrigation field has been adequately located so any surface runoff will not discharge into surface waters, and the depth to groundwater (20-24 mbgl) is considered too far for seepage impacts.

The spray irrigation area is sparsely vegetated with no threatened or priority flora. Only a small amount of remanent vegetation is expected to be influenced by an increase in soil nutrients.

The size of the proposed spray irrigation land area will be 0.81 hectares which is approximately 2.5 times larger than recommended in accordance with US EPA guidelines (US EPA, 2006).

The Applicant has committed to daily inspections of the WWTP and spray irrigation area. Monthly sampling of the wastewater will be undertaken to ensure the WWTP is continuing to perform to the manufactures specifications.

6.5.6 Key findings

The Delegated Officer has reviewed the information regarding the disposal of treated effluent to land and has found:

1. *The WWTP spray irrigation field has been adequately located so that no surface runoff discharges into any surface waters.*
2. *The distance to groundwater (20-24 mbgl) makes it unlikely that potential seepage will reach groundwater.*
3. *The maximum irrigation rate in accordance with AS/NZS 1547: 2012 for earthy red sands (soil type in this area) to avoid water logging is 5 L/m^2/day. The effluent discharge rate is 2.94 L/m^2/day (25 m^3/day) and therefore satisfies this criterion.*
4. *The expected maximum concentration levels for Nitrogen and Phosphorus in the discharged effluent will be less than 36 mg/L and less than 9 mg/L respectively. These levels are below trigger values set out in the ANZECC (2000) guidelines when impacts to native vegetation could occur if these values are exceeded.*
5. *The estimated irrigation land area required to manage the rate of wastewater discharge has been calculated at 0.35 hectares (based upon the maximum rate of 25 m^3/day). The proposed size of the spray irrigation area is 0.81 hectares and therefore satisfies this criterion.*
6. *The expected water quality of the effluent meets the guidelines set out in the ANZECC (1997) Category C – secondary treatment for infiltration.*
7. *This area experiences high evaporation rates with low rainfall. Combined with earthy red sands interspersed with gravel and iron stone, a large amount of the wastewater discharged is expected to experience evapotranspiration with minimal infiltration to the ground expected.*

The controls proposed by the Applicant are likely to be sufficient to manage the potential impacts from irrigation of treated wastewater to land.

6.5.7 Consequence

The Delegated Officer has determined that the impact of irrigation will have minimal onsite impacts. Therefore, the Delegated Officer considers the consequence of irrigation to be **slight**.

6.5.8 Likelihood of Risk Event

The Delegated Officer has determined that the likelihood of the risk even occurring is **unlikely**.

6.5.8 Overall rating of disposal of treated effluent to land

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 14) and determined that the overall rating for the risk of irrigation is **Low**.

6.6 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 13 below. Controls are described further in sections 6.4 and 6.5.

Table 13: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
1.	Seepage through the walls of the TSF	Leachate from the TSF Operational Pond	Stored tailings material becoming dispersive and structurally weak, causing discharge of stored water and potentially harmful dissolved constituents to the walls of the TSF and into the environment	Infrastructure design and construction requirements (decant tower for recovery, evaporator to maximise evaporation and groundwater monitoring bores) Requirements regarding operation of infrastructure	Moderate consequence Possible likelihood **Medium Risk**	Acceptable subject to regulatory controls Construction requirements for the Works Approval Applicant controls to be specified as construction requirements for the Works Approval Requirements regarding operation of infrastructure to be included in Licence
2.	Seepage from the base of the TSF	Leachate from the TSF Operational Pond	Seepage creating a shallow perched aquifer beneath the TSF providing a pathway to transport potentially harmful dissolved chemical constituents to	Infrastructure design and construction requirements (decant tower for recovery, evaporator to maximise evaporation and groundwater monitoring bores) Requirements regarding operation of infrastructure	Moderate consequence Possible likelihood **Medium Risk**	Acceptable subject to regulatory controls Construction requirements for the Works Approval Applicant controls to be specified as construction requirements for the Works

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
			vegetation and soil fauna near the TSF.			Approval Requirements regarding operation of infrastructure to be included in Licence
3.	Irrigation to land with nutrient rich water	Effluent from the treatment of sewage at the WWTP	Increased soil nutrients and water logging causing a detrimental effect on native vegetation	Positioned away from surface water features and in a sparsely vegetated area. Routine inspections and monitoring of treated wastewater to ensure the WWTP is continuing to perform to the manufactures specifications. Appropriately sized system to manage generated sewage waste	Slight consequence Unlikely likelihood **Low Risk**	Acceptable subject to regulatory controls Construction requirements for the Works Approval

7. Consultation

Table 14: Summary of consultation

Method	Comments received	DWER response
Application advertised on the department's website 20 May 2020	None received	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal on 20 May 2020 and again on 25 June 2020.	DMIRS did not provide a comment by the due date.	N/A
Works Approval Holder was provided with draft amendment on 26 June 2020	Refer to Appendix 2	Refer to Appendix 2

8. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a works approval amendment will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

8.1. Summary of amendments

Table 15 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Works Approval as part of the amendment process.

Table 15: Works approval amendments

Condition No.	Proposed amendments
Not applicable	Works Approval page updated by: • removing the Category 5 prescribed premises as this activity will no longer occur at the Premises; and • Included new prescribed premises category 85 for the sewage facility.
Not applicable	Definitions section updated by: • removing the definition of the LEAF assessment process as tailings will no longer be produced at the Premises; and • the inclusion of definitions for material defect and professional engineer, which are additional terms used in conditions of the Works Approval.
Not applicable	The Interpretation section has been updated to the latest DWER templates dated 27 February 2020.
1	All reference to the infrastructure associated with the construction of the ore processing facilities has been removed as it will no longer be required. Additional requirements for the mine dewatering has been updated to include: • Identifying the discharge of dewatering water to the TSF must occur at the 'Water Discharge Point'. • Temporary discharge of dewatering effluent to the drainage line is only to occur for a maximum of 4 months. • Total volume of dewatering effluent discharged to the drainage line is not to exceed 233,000 m^3. Class II putrescible landfill updated to include the new locations for the Woodleys North and South Pits. Requirement for the landfills were also updated by removing the requirement for a 20 m separation distance between the base of the landfill and the highest level of the water table. A new separation distance of 3 m has been applied in accordance with the EP (Rural Landfill) Regulations 2002. New WWTP construction and operation requirements included.
2	All reference to the critical containment infrastructure associated with ore processing has been removed as it will no longer be required. The TSF critical containment infrastructure has been updated to include the requirements for using the historical TSF for the temporary storage of dewatering effluent, including the construction of an operational pond and decant tower and the installation of a mechanical evaporator. The requirements of the evaporation/infiltration pond have been updated to include reference to the location of the monitoring bores following the submission of the proposed groundwater monitoring program as required by Existing Works Approval condition 26(Groundwater monitoring Program, 2020). Groundwater monitoring bore 'Pond BH-04' was also included in addition to the two bores proposed by the Works Approval Holder. The additional bore will provide an increased awareness of the impacts from discharging

	dewatering effluent to the evaporation/infiltration pond.
New conditions 3 and 4	Previous conditions 3 to 7 have been updated to new conditions 3 and 4. These conditions have been updated into the latest format and the requirements for reporting on the constructed infrastructure identified in tables 2 and 3 have been combined. The obligations of the Works Approval Holder has not changed. Any reference to the TSF as a facility for storing tailings material has been removed as the processing of ore will no longer occur at the Premises.
Condition 5	Previous conditions 8 and 9 have been combined to create new condition 5. The obligations of the Works Approval Holder has remained the same except for DWER's requirement of notification to the Works Approval Holder following submission of the Critical Containment Infrastructure Report. This notification is no longer relevant as the TSF will no longer receive tailings material.
Condition 6	Previously condition 10. This condition has been updated by: • Removing reference to the Processing Plant as this facility will no longer be built; • Updated the TSF to TSF Operational Pond; • Increased the commissioning period of the evaporation/infiltration pond from 7 days to 30 days to align the time period with other infrastructure; and • Included the new WWTP
Previous conditions 11 and 12	Conditions removed as no longer relevant.
Condition 7	Previous condition 13. No changes
Condition 8	Previous condition 14. Condition updated by removing any reference to removed conditions and updated condition numbering. The obligations of the Works Approval Holder have remained the same.
Condition 9	Previous condition 15. Reference to conditions updated to new condition numbers. The obligations of the Works Approval Holder have remained the same.
Condition 10	Previous condition 16. Reference to conditions updated to new condition numbers. The obligations of the Works Approval Holder have remained the same.
Condition 11	Previous condition 17. No changes
Condition 12	Previous condition 18. Condition updated by: • removing any reference to removed conditions which includes the requirement to report on ore processing as this will no longer be occurring at the Premises; • changing the requirement to report on the water balance at the TSF and Process Water Dam, to the TSF Operational Pond; • including the reporting on the vegetation monitoring required during the temporary discharge to the ephemeral drainage line; and • remove reference to the groundwater monitoring (which required submission in condition 26). The program has been provided by the Works Approval Holder (Groundwater Monitoring Program, 2020).
Previous condition 19	Condition removed as no longer relevant.
Previous condition 20	Condition removed as no longer relevant.
Condition 13	Previous condition 21. TSF Operational Pond and the WWTP included in specified emissions. Condition numbering updated.
Conditions 14 and 15	Previous conditions 22 and 23. No changes
Previous condition 24	Invalid condition number. Removed.

Condition 16	Previous condition 25. Condition numbering updated.
Previous condition 26	Condition removed as no longer relevant. The Works Approval Holder has already provided the report required by this condition.
Condition 17	Previous condition 27. Condition updated to include the 3 new evaporation/infiltration pond groundwater monitoring bores identified in the submitted program required in the previous condition 26 (Groundwater Monitoring Program, 2020), and remove 3 piezometers that are no longer required.
Condition 18	Previous condition 28. Condition numbering updated.
Condition 19	Previous condition 29. Condition updated by removing any reference to tailings pipelines and including inspections of the freeboard at the TSF Operational Pond embankment.
Condition 20	Previous condition 30. Condition numbering updated.
Previous condition 31	Condition removed as no longer relevant. The Works Approval Holder has already provided the report required by this condition.
Previous condition 32	This condition has been updated by removing all requirements to undertake test work on fresh tailings material as this will no longer be produced.
Previous condition 33	Condition removed as no longer relevant.
Conditions 21 and 22	Previous conditions 34 and 35. No change.
Schedule 1: Maps	Premises map updated to include the new location of the Class II putrescible landfill.
Schedule 2: Site Plans	Site Plan 1 - Updated to show the general arrangements of the TSF Operational Pond Site Plan 2 - Updated to show the design of the TSF Operational Pond Site Plan 3 and 4 - Removed as no longer relevant Site Plan 5 – Updated to Site Plan 3. No other changes Site Plan 6 – Updated to Site Plan 4. No other changes New Site Plan 5 to indicate the locations of the TSF monitoring bores. New Site Plan 6 to indicate the locations of the evaporation/infiltration pond monitoring bores.
Schedule 3 Works	Updated Schedule number. Removed all reference to ore processing facilities, chemical storage for processing and TSF embankment lifts as these are no longer relevant. Included the new TSF Operational Pond and WWTP as authorised works.
Schedule 4	Updated by: • removing category 5 as it is no longer applicable; • increasing the category 6 throughput; • increasing the throughput at the category 64 landfill; and • including new category 85 sewage facility.

Alana Kidd

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Alana Kidd
Manager, Resource Industries
An officer delegated by the CEO under section 20 of the EP Act

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Application form including attachments	Application	DWER records DWERDT259663
2	Egan Street Resources Limited, Rothsay Mine, W6195/2018/1, *Amendment Application Supporting Documentation*, 3 March 2020	Application	DWER records DWERDT259672
3	Email titled "Rothsay-Putrescible Landfill " dated 18 June 2020 11:55am and authored by Joanne Kiddie of SilverLake Resources	-	DWER records A1904535
4	Egan Street Rothsay Pty Ltd, Rothsay Gold Mine, *Vegetation Monitoring Operation Procedure Discharge to Drainage Line,* 28 January 2020	-	DWER record A1862721
5	Egan Street Rothsay Pty Ltd, Rothsay Gold Mine, *Groundwater Monitoring Program Evaporation Pond,* 20 January 2020	Groundwater Monitoring Program, 2020	DWER record DWERDT243269
6	DWER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	-	accessed at www.dwer.wa.gov.au
7	DWER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	-	
8	DWER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	-	
9	DWER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	-	
10	DWER, June 2019. *Guideline: Decision Making.* Department of Water and Environment Regulation, Perth	-	
11	Department of Health, *Approval to Construct or Install an Apparatus for the Treatment of Sewage,*	-	DWER record
12	Steve Appleyard, DWER Principal Hydrogeologist, Contaminated Sites, memorandum, 4 June 2020	Appleyard, 2020	DWER record A1905271

Appendix 2: Summary of Works Approval Holder comments

The Works Approval Holder was provided with the draft Amendment Report on 26 June 2020 for review and comment. The Works Approval Holder responded on 26 June 2020. The following comments were received on the draft Amendment Report.

Condition	Summary of Works Approval Holder comments	DWER response
Condition 1, Table 2	Requested the requirement for fencing of the landfill be removed as the pits are below ground and therefore the pit walls act as effective barriers.	Supported. Condition updated.
Condition 1, Table 2	Request for the removal of the workshop, wash down bay, oily water separator from the construction and installation requirements as these activities are not prescribed.	Supported. This type of infrastructure is not considered prescribed and therefore does not require approval. The provisions of the EP Act regarding preventing pollution and environmental harm still apply.
Condition 2, Table 3	Agreed to the installation of the shallow monitoring bore in consultation with a hydrogeologist including development of an SWL 'trigger level'. Requested the cut off drain/trench be installed if groundwater monitoring of the shallow monitoring bore indicates lateral mounding/seepage is occurring according to the trigger level. To install a retrospective cut off trench requires DMIRS approval including geotechnical assessment of the stability of the wall adjacent to the trench. This assessment and approval will be completed ready for the installation of the trench if the trigger level is reached or there is indication of lateral seepage.	Supported. Condition updated to include the requirement for the installation of a shallow groundwater monitoring bore and creation of a groundwater monitoring program by the 31 October 2020. The monitoring program is to include trigger values for determining any impacts from lateral seepage and the subsequent management actions. The requirement to install a cut-off drain/trench has been removed.
Condition 2, Table 3	Advised the requirement to undertake dispersion, pinhole and column testing of the tailings material from the walls of the operational pond is unnecessary, as the TSF embankments were constructed of waste rock instead of tailings material. The Works Approval Holder has also advised the tailings material would pass the required tests and therefore will undertake the required tests and present the results in the Environmental Compliance Report. If the tests indicate the tailings material maybe subject to	Partially supported. The TSF Operational Pond will be excavated up to the historical TSF embankments on the southern and eastern walls only. The northern and western walls of the pond will be constructed by an excavation in the historical tailings material. Therefore dispersion test work is still

Condition	Summary of Works Approval Holder comments	DWER response
	erosion and tunnelling, an independent risk assessment will be completed by a tailings engineer with their recommendations for the proposed controls implemented.	required in order to determine the suitability of the pond walls in those locations. The Works Approval Holder has agreed to undertake the required test work and therefore this requirement will remain. The requirement to apply gypsum to the pond walls and the compaction of the pond walls if the tailings material is determined as unsuitable has been removed. A new requirement to provide to the CEO within 14 days the results of the test work has been included.
Condition 2, Table 3	TSF groundwater monitoring bore TSF BH-01 has been renamed as TSF BH-01A and the location was adjusted following hydrogeological advice	Supported. Name and location updated.
Condition 2, Table 3	The Works Approval Holder will install the additional groundwater monitoring bore BH-04, however the original coordinates provided are outside of the DMIRS approved disturbance area by 10 metres and therefore needs to be shifted accordingly. The new coordinates will be provided with the Construction Compliance Report.	Supported. Coordinates removed from this condition. Approximate location for monitoring bore BH-04 shown in Site Plan 6 of Schedule 2 to remain.
Condition 2, Table 3	Requested the constraints of HDPE pipeline sizing be removed to allow for construction flexibility.	Supported. This requirement has been removed.
Condition 17	Requested an update to this condition so the TSF monitoring bore coordinates replicate the coordinates shown in Table 3.	Supported. Condition updated.