



Application for Licence

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

Licence Number	L9375/2023/1
Applicant	OZ Minerals Musgrave Operations Pty Ltd
ACN	640 213 341
File number	DER2023/000114
Premises	West Musgrave Project Mining Licences: M 69/149, L 69/56 and L 69/57 As defined by the premises map and coordinates attached to the issued licence
Date of report	30/06/2023
Decision	Licence granted

**MANAGER, PROCESS 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 operation of the premises. As a result of this assessment, Licence L9375/2023/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Application summary and overview of premises

On 9 February 2023, the applicant submitted an application for a licence to the department under section 57 of the *Environmental Protection Act 1986* (EP Act).

The application is to seek a licence relating to operation of the Exploration Camp Wastewater Treatment Plant (EXPO WWTP) at the West Musgrave Project (WMP) (the premises). The WMP is located in the West Musgrave Ranges of Western Australia approximately 1,300 km north-east of Perth near the intersection of the borders between Western Australia, South Australia and the Northern Territory.

The premises relates to the category 54: sewage facility premises and assessed production / design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in licence L9375/2023/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in licence L9375/2023/1.

2.2.1 Wastewater treatment

Construction of the EXPO WWTP was authorised under works approval W6579/2023/1 and is comprised of two separate identical above-ground Sequencing Batch Reactor (SBR) systems located adjacent to the Exploration Camp which have a combined total output design capacity of 100m³ per day, constrained by a Department of Health (Health WA) approval which allows for a daily outflow of 15m³ for each SBR (total of 30m³/day outflow).

The WWTP is part of a multistage construction with the SBR systems to be operated until such time as the Passive wastewater system is installed and commissioned at the permanent accommodation village, as assessed in the works approval.

The current WWTP consists of a containerised liquid wastewater treatment process and control room with an external irrigation tank. Through a combination of anoxic and aerobic phases to achieve effluent with high levels of biological oxygen demand (BOD) and nitrogen removal, wastewater is discharged to a designated fenced, sign posted, not-for-human contact, irrigation spray field via an above ground sprinkler arrangement.

Suspended solids settling allows for the separation of sludge and treated wastewater, which are stored in separate tanks prior to removal/discharge.

Once the Passive wastewater system is operational, treated wastewater is required to meet effluent Class A specification (Table 1) before reuse within the processing plant to supplement groundwater-sourced raw water. Treated effluent that does not meet the effluent specification for reuse in the processing plant (i.e., treated effluent that meets Class C specification) will be

directed to an irrigation field to facilitate evaporation. Up to 30m³/day will be directed to the irrigation field from the current EXPO WWTP. For this operation of the SBR systems, treated wastewater is expected to meet Class C specification whilst further WWTP works associated with works approval W6579/2023/1 are expected to produce effluent that meets Class A specification.

Table 1: WWTP Influent and Effluent Specifications

Parameter	Class C (SBR systems)		Class A (Passive wastewater system)	
	Influent	Effluent	Influent	Effluent ¹
Hydraulic capacity (kL/d)	100	100	225	225
Biological Oxygen Demand, BOD (mg/L)	350	<20	350	<10
Total Suspended Solids, TSS (mg/L)	350	<30	350	<10
Total Nitrogen (mg/L)	60	<30	50	30-55
Total Phosphorus (mg/L)	14	<8	15	6-14
pH	6.5 – 8.5	6.5 – 8.5	6.5 – 8	6.5 – 8.5
FOG (mg/L)	50	<5	100	<10
E Coli (cfu/100 mL)	N/A	<1,000	10 ⁴ – 10 ¹⁰	<1
Residual Chlorine (mg/L)	N/A	0.2 – 2.0	N/A	0.2 – 2.0
Turbidity (NTU)	-	-	High	<2 (95%) <5 (Max)

Note 1: final treatment standard.

2.2.2 Environmental commissioning

Environmental commissioning was undertaken between 10 December 2022 and 30 March 2023. A review of the commissioning report determined that the conditions specified in works approval W6579/2023/1 were complied with, with the exception of certain effluent samples failing to meet expected treatment criteria. Levels of nitrogen, phosphorus and residual chlorine were intermittently above limits specified in discharge monitoring for time limited operations.

With the exception of continuous volumetric flow monitoring, sampling was required to be undertaken only once during the period however sampling was undertaken three times during commissioning and initial time limited operations phase. Each sampling event returned results for certain parameters outside of expected performance levels, although these exceedances were generally minor in nature, or showing improvement with successive sampling events.

Preliminary investigations by the applicant determined that certain functions of the treatment plants were not operating optimally (including plant automation and equipment issues), and reflective of general commissioning and early start-up of the treatment plants. In response, the applicant detailed a number of relevant corrective measures taken, or in progress, to address the exceedances observed. It was also noted nitrogen and phosphorus treatment may be dependent on the age of the treatment system, as bacteria is yet to sufficiently build up and sludge is currently immature.

Monitoring and limits conditioned for the duration of time limited operations of the works approval have been included as licence conditions for the ongoing operation of the SBR WWTP's.

2.3 Legislative context and other approvals

2.3.1 Part IV of the EP Act

The premises is subject to Ministerial Statement 1188 (MS 1188) Report 1720, issued on 20 April 2022, which specifies criteria for the construction and operation of a copper and nickel mine, processing facility and supporting infrastructure and requires the implementation of the West Musgrave Copper and Nickel Project Groundwater Monitoring and Management Plan due to the potential for tailing storage facility (TSF) seepage impacts as a result of the project.

2.3.2 Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974

Approval to construct or install an apparatus for the treatment of sewage was issued on 6 December 2022 (approval number: 200.22) which outlines the conditions of construction and associated controls. Each SBR system is approved for a maximum daily wastewater volume of 15,000L/day (15m³)

On 21 December 2022, Health WA and the Shire of Ngaanyatjarraku approved a Permit to use - apparatus for the treatment of sewage (Permit to Use Number: 01 22/23, Expiry 21 December 2024) for the EXPO WWTP under the Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974. The Permit is subject to all ongoing maintenance, sampling, reporting and other requirements, per the Health WA's approval, being addressed as required.

3. Risk assessment

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

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

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

Table 2: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Operation			
Wastewater	SBR treatment tanks and pipework	Overland flow or discharge of untreated or partially treated wastewater causing ecosystem disturbance or impacting groundwater quality. Infiltration of nutrient rich (treated) wastewater impacting groundwater quality and/or proliferation of invasive species.	<ul style="list-style-type: none"> Wastewater and sludge will be stored and treated in tanks fitted with high level alarms to avoid discharge. The WWTPs would have contingency storage for up to 24 hours of normal flow if discharge is suspended while other measures (pumping and carting) are in place to handle any excess. The application of effluent will be controlled to prevent pooling and surface water run-off.
Treated wastewater irrigation	Discharge to irrigation fields		<ul style="list-style-type: none"> Wastewater will be treated to quality outlined in Table 1. The irrigation sprayfield is adequately sized to absorb nutrient loads from the treatment plant. Nitrogen and phosphorus application to the sprayfield will be below the maximum application rate for Risk Category D listed in Water Quality Protection Note 22: Irrigation with Nutrient-rich Wastewater (Department of Water 2008). The application of effluent will be controlled to prevent pooling and infiltration beyond the receiving vegetation. The irrigation area has been fenced and signposted.
Odour	Wastewater treatment and discharge to irrigation fields	Air / windborne pathway	<p>Considerable distance to receptors.</p> <p>Control of the WWTP process, including:</p> <ul style="list-style-type: none"> Increasing the dissolved oxygen in the WWTP to prevent anaerobic digestion; Increased circulation to ensure dissolved oxygen is evenly distributed; and Adding sodium hypochlorite to increase the sewage pH, thus limiting the generation of H₂S.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant's employees, visitors, and contractors from its assessment. Protection

of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

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

Human receptors	Distance from prescribed activity
Jameson community	26 km north of the premises
Traditional owners – visitation to land	Adjacent
Aboriginal and other heritage sites	A small number of potential archaeological sites and archaeological locations have been identified in the prescribed premises boundary, although not in proximity to location of WWTPs located adjacent to existing exploration camp. The proposed project is located within the 98,000 km ² Ngaanyatjarra Indigenous Protected Area (IPA) ID314989.
Public drinking water source areas	<ul style="list-style-type: none"> Jameson bore, approximately 32 km from the WMP area; Linton bore, approximately 17 km south-east of the SBR WWTP location.
Environmental receptors	Distance from prescribed activity
There are no Threatened Ecological Communities (TEC) or Priority Environmental Communities (PEC) in the WMP area.	<ul style="list-style-type: none"> Closest TEC is over 800 km southwest Closest PEC is located over 400 km west
Threatened and/or priority fauna Great Desert Skink (<i>Egernia kintorei</i>) listed as vulnerable The Priority fauna species in the Development Envelope	Great Deseret Skink, Straited Grass Wren, Brush-tailed Mulgara and Southern Marsupial Mole recorded within or adjacent to the WMP area, although not in proximity to location of WWTPs.
There are no threatened and/or priority flora	8 priority flora species have been observed inside the premises boundary, although not in proximity to location of WWTPs
Surface waters	There are no ephemeral surface waters within 500m of prescribed premises activities
Groundwater	Depth to groundwater ranges between 2.7 and 14.5 metres below ground level (mbgl) sitting at a site-wide average water level of 6.5 mbgl. Salinity ranges from marginal to brackish (920 to 4,500 mg/L total dissolved solids (TDS)) and is variable across the project area. Slightly alkaline pH (7.5 – 8.5)

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 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 licence as regulatory controls.

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

Licence L9375/2023/1 that accompanies this decision report authorises emissions associated with the operation of the premises i.e. wastewater treatment and discharge of treated wastewater to irrigation fields.

The conditions in the issued licence, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

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

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls			
Operation							
Wastewater treatment and discharge to irrigation fields	Wastewater	Overland flow or discharge of untreated or partially treated wastewater causing ecosystem disturbance or impacting groundwater quality.	Native vegetation Groundwater resources	Refer to Section 3.1	C = Minor L = Rare Low Risk	Y	Consistent with applicant commitments. No further regulatory controls required.
	Discharge to land	Infiltration of nutrient rich (treated) wastewater impacting groundwater quality and/or proliferation of invasive species.		Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Consistent with applicant commitments. Ongoing monitoring of WWTP outputs will be required to ensure risk is maintained.
	Odour	Air/windborne pathway causing impacts to amenity	Visitors to the area No nearby residential receptors	Refer to Section 3.1	C = Slight L = Rare Low Risk	Y	No conditions for the management of odour during WWTP operation.

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

4. Consultation

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

Table 5: Consultation

Consultation Method	Consultation Method	Department Response
Application advertised on the department's website on 22 March 2023	None received.	N/A
Ngaanyatjarra Council advised of application 27 March 2023	None received.	N/A
Applicant was provided with draft documents on 1 June 2023	Comments received from the licence holder on 28 June 2023 have been considered by the Delegated Officer as detailed in Appendix 1.	Refer to Appendix 1.

5. Conclusion

Exploration Camp WWTP operates at prescribed thresholds (30m³/day) and treated wastewater is discharged to an appropriately sized irrigation field, until such time as the Passive wastewater system is constructed. Based on the assessment in this decision report, the Delegated Officer has determined that a licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Conditions relating to operational requirements, monitoring, limits and reporting for the SBR systems at the EXPO WWTP only, including discharge to the irrigation field, have been transferred from works approval W6579/2023/1 to the licence.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water 2008, *Water Quality Protection Notice 22: Irrigation of nutrient rich wastewater*, Perth, Western Australia
3. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
4. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Assessed production / design capacity.	The licence application and construction compliance report initially determined that the cumulative processing volume limit to be 40m ³ per day however this was inconsistent with the volumetric flow rate limit in the works approval and the Department of Health (Health WA) approval. The applicant requests that the licence reflects either the Health WA approved daily capacity (30m ³) or the total daily capacity of the SBRs (100m ³), which would then be limited through the constraints described in the Health WA approval.	The Delegated Officer accepts the changes and has determined that that limit should be set to 30m ³ per day to be consistent with the Health WA regulatory approval.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY						
Application type						
Licence	☒	Relevant works approval number:	W6579/2021/1	None	<input type="checkbox"/>	
		Has the works approval been complied with?		Yes <input checked="" 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 checked="" type="checkbox"/>
		Environmental Compliance Report submitted?		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
		Date Report received: 5 January 2023				
Date application received		9 February 2023				
Applicant and Premises details						
Applicant name/s (full legal name/s)		OZ Minerals Musgrave Operations Pty Ltd				
Premises name		West Musgrave Project				
Premises location		M 69/149, L 69/56 and L 69/57 Activity referenced in this application occurs on M69/149.				
Local Government Authority		Shire of Ngaanyatjarra				
Application documents						
HPCM file reference number:		DER2018/001042-6~4				
Key application documents (additional to application form):		Attachment 1A-C, 2, 3A, 7, 10 on HPCM file				
Scope of application/assessment						
Summary of proposed activities or changes to existing operations.		Operation of Exploration Camp WWTP and irrigation field.				
Category number/s (activities that cause the premises to become prescribed premises)						
Table 1: Prescribed premises categories						
Prescribed premises category and description			Assessed production or design capacity			
Category 54: Sewage facility: premises — (a) on which sewage is treated (excluding septic tanks); or (b) from which treated sewage is discharged onto land or into waters.			40m ³ /day			
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 checked="" type="checkbox"/> No <input type="checkbox"/>		Ministerial statement No: 1188 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: Permit not required – no clearing of vegetation.		

Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input type="checkbox"/> General lease <input type="checkbox"/> Expiry: Mining lease / tenement <input checked="" type="checkbox"/> Expiry: 03/07/2043 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: Shire of Ngaanyatjarraku does not have a planning scheme, no planning approval required. Approval to use issued by Ngaanyatjarraku Shire 21/12/2022.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A No clearing is proposed.
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 is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: Licence/permit No: Groundwater Abstraction Licence Instrument No. GWL207745(1) issued 29 August 2022. Approval to construct bores Licence Instrument No. CAW207479(1) issued 3 June 2022
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Type: Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
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: 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 xxx</i>)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
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 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"/>	N/A