Decision Report

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Application for Licence

Part V Division 3 of the Environmental Protection Act 1986

Licence Number L9360/2022/1

Applicant IB Operations Pty Ltd

ACN 165 513 557

File number DER2022/000609

Premises North Star Magnetite Project

Marble Bar Wastewater Treatment Plant

Legal description -

Part of Mining Tenement L45/486

Marble Bar Road

MARBLE BAR WA 6760

As defined by the coordinates in Schedule 2 of the licence

Date of report 21 February 2023

Proposed Decision Licence granted

Stephen Checker
MANAGER WASTE INDUSTRIES

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

Table of Contents

1.	Decis	ion su	mmary	.1		
2.	Scope	e of as	sessment	.1		
	2.1	Regula	atory framework	.1		
	2.2	Applica	ation summary and overview of premises	.1		
	2.3	Part IV	of the EP Act	.1		
3.	Risk a	assess	ment	.1		
	3.1	Source	e-pathways and receptors	.1		
		3.1.1	Emissions and controls	.1		
		3.1.2	Receptors	.3		
	3.2	Risk ra	ıtings	.3		
	3.3	Detaile 5	ed risk assessment for treated wastewater and RO reject discharge to lan	d		
		3.3.1	Irrigation spray-field sizing	.5		
		3.3.2	Effluent quality	.5		
		3.3.3	Nutrient loading assessment	.6		
4.	Consi	ultatio	n	.6		
5 .	Concl	usion		.7		
Refe	rences	S		.8		
			mary of applicant's comments on risk assessment and draft	.9		
Appe	endix 2	2: App	lication validation summary1	0		
Table	e 1: Pot	ential e	missions and proposed applicant controls	.2		
Table	2: Sen	sitive h	uman and environmental receptors and distance from prescribed activity	.1		
			sment of potential emissions and discharges from the premises during			
Table	Fable 4: Proposed effluent quality to be discharged to the irrigation spray-field					
Table	5: Cor	nsultatio	n	.6		
Figur	e 1: Dis	stance t	o sensitive receptors	.2		

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 L9360/2022/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Application summary and overview of premises

On 22 September 2022, 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 the continued operation of the wastewater treatment plant at the premises. The premises is approximately 50 km northwest of Marble Bar. The construction and time-limited operation of the wastewater treatment plan were approved under works approval W6596/2021/1.

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 licence L9360/2022/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in licence L9360/2022/1.

2.3 Part IV of the EP Act

The premises is subject to Ministerial Statement 993 (MS993), issued on 5 January 2015 which specifies criteria for the construction and operation of an open-cut iron ore mine and associated infrastructure forming part of the North Star Magnetite Project. The Delegated Officer has determined that the proposal is consistent with MS993.

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 1 below. Table 1 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Potential emissions and proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls		
Operation					
Odour	WWTP operations, including screening	Air/windborne pathway	WWTP tanks are contained and not expected to release odour		
	and sludge removal		Treated wastewater being discharged to the irrigation spray-field is not expected to be odorous		
			Maintenance schedule to include odour checks around the facility and any follow up repair works in response to odour release where required		
Spills/ unintended	Infrastructure and equipment failure Maintenance works	Seepage to soil and groundwater	Groundwater separation greater than 80 mbgl (risk of permeation to groundwater is low)		
releases of partially treated wastewater or	Wallichards Works		WWTP systems will monitor tank volumes with an alarm system to notify operator of high-risk volumes		
solid waste			WWTP installation over compacted ground		
oona madio			Screenings to be collected in dedicated bins and periodically removed by a licensed carrier to an appropriately licensed facility		
			Sludge to be collected in sludge tanks and periodically removed by a licensed carrier to an appropriately licensed facility		
Spills/unintended releases of	Chemical handling and storage	Seepage to soil and	Chemical storage area to be fully contained and bunded where required		
hydrocarbons or		groundwater	Chemical storage tanks to include HDPE chemical containment bunding		
chemicals			Storage of chemical materials to be in accordance with Australian Standards including:		
			AS1940-2004 – Storage and Handling of Flammable and Combustible Liquids		
			AS3780-2008 – Storage and Handling of Corrosive Substances		
			AS3833-2007 – Storage and Handling of Mixed Classes of Dangerous Goods.		
			Chemical storage tanks within the WWTP to have sufficient capacity for several weeks of normal system operation		

File number: DER2022/000609

2

Emission	Sources	Potential pathways	Proposed controls
Nutrient-rich, saline treated	Discharge of blended treated	Seepage to soil and groundwater	Minimal disturbance and clearing of vegetation
wastewater	sewage and RO brine to irrigation spray-field		groundwater
	opraty note		1% slope grade across the designated irrigation spray-field area
			Windrowing the lower slope grade of the discharge area to contain any run-off
			Groundwater separation greater than 80 mbgl and risk of permeation to groundwater is low
			Field permeability results indicate moderately average permeability rate of 1.5m/day
			Regular monitoring of treated wastewater quality
			Ensuring wastewater is treated to below target concentration limits for all parameters
Contaminated or potentially	Stormwater interaction with	Seepage to soil and groundwater	1% slope grade across the designated spray-field area
contaminated stormwater	plant and irrigation spray-field		Windrowing the lower slope grade of the discharge area to contain any run-off
		Overland flow during heavy downpours	Groundwater separation greater than 80 mbgl and risk of permeation to groundwater is low
			WWTP installation over compact ground

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 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 (*Guideline: Environmental Siting* (DWER 2020)).

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

Human receptors	Distance from prescribed activity
Native Title Holders the Nyamal people (via the Nyamal Aboriginal Corporation RNTBC)	The proposed Premises is located within the Nyamal Native Title Determination area (WCD2019/011). Native Title Holders visiting this area are considered a potential human receptor to activities on the Premises.
Environmental receptors	Distance from prescribed activity
Surface waters	The proposed premises is located within the Pilbara Surface Water Area (proclaimed under the RIWI Act 1914) and the De Grey River Basin area within the De Grey River/Shaw River catchment.
	Based on the 1:250,000 Hydrography WA map of the region:
	 An unnamed minor non-perennial watercourse runs through the prescribed premises boundary. A major non-perennial watercourse (Shaw River) is located ≈ 9 km north-west of the prescribed premises boundary.
Groundwater	The proposed premises is located within the Pilbara Groundwater Area (proclaimed under the RIWI Act 1914).
	The drilling of two pilot holes by the applicant have detected groundwater within a fractured rock zone between 80 – 88 mbgl.
	Groundwater licence GWL175700 permits the taking of 20,000,000kL of water per annum from the confined Wallal Aquifer located within the Canning Basin bore field (located approx. 160km east of Port Hedland). This water is transported via a water pipeline along the water corridor development envelope for a range of activities which includes dust suppression for earthworks and construction activities and mining camp purposes associated with this works approval application.
	DWER Water Information Reporting Database indicates a nearby bore (71010054) drilled to a depth of 16.5m which is recorded as dry.

1

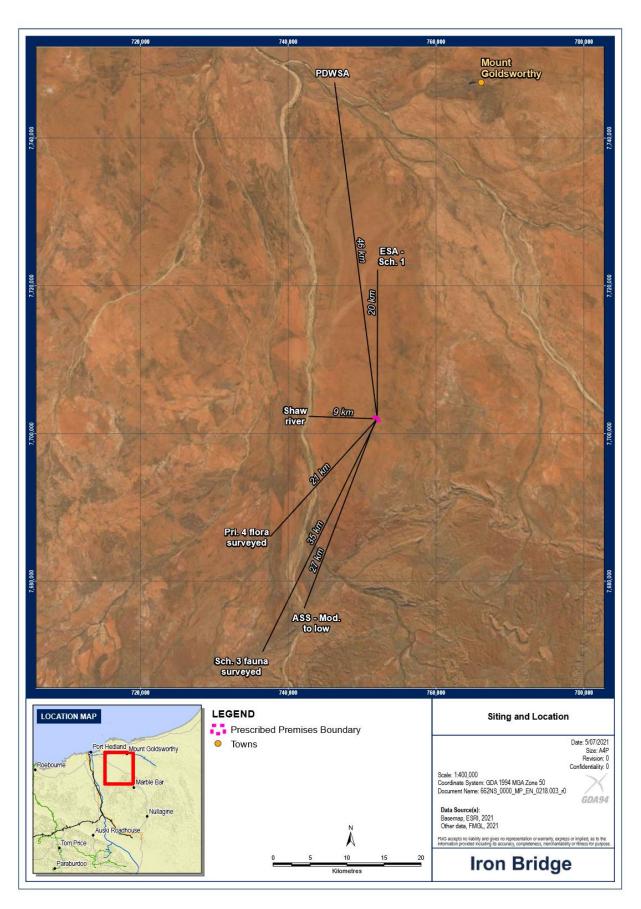


Figure 1: Distance to sensitive receptors

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 3.

Licence L9360/2022/1 that accompanies this decision report authorises emissions associated with the operation of the premises i.e., sewage treatment plant and associated spray-field.

The conditions in the issued licence, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

3

File number: DER2022/000609

Table 3: Risk assessment of potential emissions and discharges from the premises during operation

Risk events					Risk rating ¹	Applicant		luctification for
Sources / activities	Potential emission	Potential pathways and impact	Receptors Applicant controls		C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Operation								
	Odour	Air / windborne pathway causing impacts to health and amenity	Visitors to the Nyamal Native Title Determination area	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Yes	No regulatory controls have been added to the works approval as odour emissions are unlikely to impact receptors during the commissioning and operation of the premises	N/A
Operation of the WWTP	Spills/ unintended releases of hydrocarbons, chemicals or partially treated wastewater	Overland runoff or pooling potentially causing	Pilbara groundwater area		C = Minor L = Likely Medium Risk	Yes	Condition 2, Table 1 Condition 3, Table 3	N/A
Discharge to the irrigation spray-field	Nutrient-rich, saline treated wastewater	ecosystem disturbance or impacting surface water quality	Minor non- perennial watercourse	Section 3.1	C = Moderate L = Possible Medium Risk	Yes	Condition 1, Table 1 Condition 2, Table 1 Condition 3, Table 3 Condition 4 Condition 5, Table 4	N/A

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

File number: DER2022/000609 4

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 treated wastewater and RO reject discharge to land

The blended treated effluent and RO brine are disposed of via a dedicated irrigation spray-field. The location, design, and dimensions of the spray-field were previously assessed under works approval W6596/2021/1.

3.3.1 Irrigation spray-field sizing

. This spray-field is proposed to be constructed in 2-stages with stage 1 to include the installation of 2.6 ha of sprinkler units, and stage 2 to install an additional 1.9 ha of sprinkler units (4.5 ha total). This staged approached is based on the expected camp accommodation occupancy during the construction project.

The applicant has provided the following description of the local soil:

"Soil type characterised by red sand over sandy clay loam to clay at 30-80 cm. The Guelph Permeability field data suggest the local subsurface profile to have a sand/trace silt profile at 0-0.15 m deep and the permeability to be approx. 1.5 m/day indicating a 'moderate' permeability rate"

Field permeability testing conducted by the applicant on the receiving soil has indicated a permeability rate of 1.5 m/day (\approx 4 mm/day). To minimise the likelihood of pooling across the irrigation spray-field, the Delegated Officer has determined a maximum of 143 m³/day (52 m³ of treated wastewater combined with 91 m³ of RO reject water) is permitted to be discharged during Stage 1, and 180 m³/day permitted during Stage 2 (89 m³ of treated wastewater combined with 91 m³ of RO reject water).

During and following heavy rain, there is the potential for this effluent to pool on the ground surface. Pooling of effluent may lead to dispersion off-site via overland flow or infiltration and migration in groundwater. The Delegated Officer considers this pooling would cause low level off-site impacts and minimal impacts at the wider scale due to the dilution effect from rainfall, the presence of a deep groundwater table and the conditions relating to irrigation operations added to the works approval as per the applicant's proposed controls.

3.3.2 Effluent quality

The applicant proposes to discharge a maximum of 180 m³/day of blended effluent to the irrigation spray-field. Based on preliminary sampling of the groundwater to be extracted for RO treatment, the applicant has calculated and expects the blended effluent to meet concentrations for the following parameters prior to discharge to the irrigation spray-field:

Table 4: Proposed effluent quality to be discharged to the irrigation spray-field

Parameter	Expected concentration
5-day biochemical oxygen demand (BOD ₅)	<20mg/L
Total suspended solids (TSS)	<30mg/L
Total nitrogen (TN)	<20mg/L**
Total phosphorous (TP)	<8mg/L**
Total dissolved solids (TDS)	<1500mg/L
E. coli	<1000cfu/100mL
Thermotolerant coliforms	<1000cfu/100mL

Environmental Protection Act 1986 Licence: L9360/2022/1

File number: DER2022/000609

Residual free chlorine	0.2 – 2.0mg/L*
Sodium ions (Na+)	350mg/L
Calcium ions (Ca ²⁺)	75mg/L
Magnesium ions (Mg ²⁺)	80mg/L
Electrical conductivity	2500µs/cm

^{*}Residual free chlorine concentrations may be measured in treated wastewater prior to mixing with RO reject.

3.3.3 Nutrient loading assessment

In accordance with field data conducted by the applicant, it has been determined that the soil in the irrigation spray-field and expected end use of this area will allow for:

- Appropriate nutrient uptake in accordance with risk category D described in Table 1 Eutrophication risk based on soil type and location, Water Quality Protection Note 22 Irrigation with nutrient-rich wastewater;
- A low-risk exposure category level in line with Table 7 Commissioning validation and verification monitoring requirements and Table 8 – Minimum ongoing monitoring requirements, Guidelines for the Non-potable Uses of Recycled Water in Western Australia:
- A medium water salinity rating (< 1500 mg/L TDS) that can be tolerated by vegetation endemic to this area: and
- A stable soil structure after conducting a soil sodicity assessment using the blended effluents expected sodium adsorption ratio against the electrical conductivity in accordance with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3, Primary Industries – Rationale and Background Information.

Considering the temporary nature of the proposed premises (12-18 months) and the applicants proposed controls in ensuring the nutrient loading on the receiving environment is managed appropriately in accordance with the above, The Delegated Officer has determined the overall rating for the risk of blended effluent discharge and soil sodicity is **Medium**.

4. Consultation

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

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 08/12/2022	None received	N/A
Local Government Authority (Shire of East Pilbara advised of proposal on 12/12/2022	None received	N/A

^{**}Analysed over an annual period to assess nutrient loading potential.

Nyamal Aboriginal Corporation RNTBC advised of proposal on 12/12/2022	None received	N/A
Department of Health	1. Wastewater Disposal	Noted
(DoH) WA advised of proposal on 12/12/2022	There are no objections to the proposal provided the apparatus is operated in accordance with Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974 and any local government requirements associated with these regulations.	Licence requires that irrigation to be managed to prevent ponding and pooling of blended effluent on the ground surface of the irrigation spray field.
	2. Medical Entomology	
	There are historically very few cases of mosquito-borne disease recorded for Marble Bar. This locality averages 1 reported human case of Ross River virus disease annually. There is limited mosquito surveillance data for the area, although it is expected that mosquitoes capable of spreading mosquito-borne disease will be present following large rainfall events.	
	On-site infrastructure, surface water management systems and constructed water bodies need to be designed and maintained to ensure they do not breed mosquitoes.	
	The proponent is to pay attention to the design and maintenance of the Wastewater Treatment Plant spray field to ensure that the irrigation volumes do not cause ponding of surface water that can support mosquito breeding.	
Applicant was provided with draft documents on	Refer to Appendix 1	Refer to Appendix 1

5. Conclusion

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.

References

- ANZECC & ARMCANZ, October 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3, Primary Industries – Rationale and Background Information. Perth, Western Australia. Accessed at: www.waterquality.gov.au
- Department of Water (DOW), July 2008. Water Quality Protection Note 22 (WQPN22): Irrigation with nutrient rich wastewater. Perth, Western Australia. Accessed at: www.dwer.wa.gov.au
- 3. Department of Health (DOH), 2011. *Guidelines for the Non-potable Uses of Recycled Water in Western Australia*. Perth, Western Australia. Accessed at: www.health.wa.gov.au
- 4. Department of Environmental Regulation (DER), July 2015. *Guidance Statement:* Regulatory principles. Perth, Western Australia. Accessed at: www.dwer.wa.gov.au
- 5. DER, October 2015. *Guidance Statement: Setting conditions*. Perth, Western Australia. Accessed at: www.dwer.wa.gov.au
- 6. DER, February 2017. *Guidance Statement: Risk Assessments*. Perth, Western Australia. Accessed at: www.dwer.wa.gov.au
- 7. Department of Water and Environmental Regulation (DWER), June 2019. *Guideline: Decision Making*. Perth, Western Australia. Accessed at www.dwer.wa.gov.au
- 8. DWER, June 2019. *Guideline: Industry Regulation Guide to Licensing*. Perth, Western Australia. Accessed at www.dwer.wa.gov.au
- 9. Department of Environment and Science (QLD), June 2020. *Disposal of effluent using irrigation*. Perth, Western Australia. Accessed at: www.publications.gld.gov.au
- 10. DWER, December 2020, *Guideline: Environmental Siting*. Perth, Western Australia. Accessed at: www.dwer.wa.gov.au
- 11. DWER, December 2020, *Guideline: Risk Assessments*, Perth, Western Australia. Accessed at: www.dwer.wa.gov.au

File number: DER2022/000609

8

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

Condition	Summary of applicant's comment	Department's response
1, Table 1	Stage 1 and two complete. Should only reference final volume of 180m³ per day.	Agreed and amended
2, Table 2	Plant will be out of TLO upon grant of this licence.	Agreed and amended
3	Remove - not used in other WWTP licences. Note – the applicant provided correspondence agreeing to retain the condition on 20/2/2023 following further discussions.	Condition retained - Given the relatively low risk of the discharge, the condition has been applied as a more flexible alternative over typical water quality limits, which would constitute a breach if any parameter was over limit for a single monitoring event. An annual N/P loading rate allows water quality to vary throughout the year as long as overall long-term nutrient discharge is within parameters.
4	Remove Points C and D. The design did not account for holding for a full day or number of days in the event of rainfall. Point E should cover of the requirement to manage pooling.	Agreed and amended
5, Table 3	Amend to Quarterly to align with all other WWTP monitoring requirements	Agreed and amended
Definitions – annual period	Requested annual period 1 January to 31 December	Agreed and amended

File number: DER2022/000609

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type	Application type				
		Relevant works approval W6596/2 number:		96/2021/1	
		Has the works approximately complied with?	oroval been	Yes ⊠ No □	
Licence	\boxtimes	Has time limited of the works approved acceptable operations.	al demonstrated	Yes ⊠ No □ N/A □	
		Environmental Co Critical Containme Report submitted?		Yes ⊠ No □	
		Date Report recei	ved: 27/06/2022		
Date application received		22/09/2022			
Applicant and Premises details	3				
Applicant name/s (full legal name	e/s)	IB Operations Pty Ltd			
Premises name		Marble Bar Wastewater Treatment Plant - North Star Magnetite Project			
Premises location		Part of Mining Ter	nement L45/486 - Ma A 6760	arble Bar Road	
Local Government Authority		Part of Mining Tenement L45/486 - Marble Bar Road MARBLE BAR WA 6760			
Application documents					
HPCM file reference number:		FA262444			
Key application documents (additional to application form):		Application form Licence cover letter Proof of occupancy ASIC extract Legal Authority Premises location Compliance demonstrated letter			
Soons of application/soossess	Siting and location	і шар			
Scope of application/assessme	#11L				
Summary of proposed activities or changes to existing operations.		Operation of Cat 5 approval W6596/2		nstructed under works	

File number: DER2022/000609 10

Category number/s (activities that cause the premises to become prescribed premises) Table 1: Prescribed premises categories Prescribed premises category Assessed production or Proposed changes to the and description design capacity production or design capacity (amendments only) 180m³/day 54 – Sewage facility Legislative context and other approvals Has the applicant referred, or do they Referral decision No: intend to refer, their proposal to the Managed under Part V ⊠ Yes ⊠ No □ EPA under Part IV of the EP Act as a significant proposal? Assessed under Part IV ⊠ Ministerial statement No: Does the applicant hold any existing MS0993 Part IV Ministerial Statements Yes ⊠ No □ relevant to the application? EPA Report No: 1514 Has the proposal been referred Reference No: and/or assessed under the EPBC Yes □ No ☒ Act? MISCELLANEOUS LICENCE 45/486 Expiry: 21 years Has the applicant demonstrated Yes ⊠ No □ occupancy (proof of occupier status)? Has the applicant obtained all Approval: relevant planning approvals? Yes □ No □ N/A ⊠ Expiry date: If N/A explain why? Has the applicant applied for, or have Authorised clearing approved an existing EP Act clearing permit in Yes □ No ⊠ under MS993 relation to this proposal? Has the applicant applied for, or have Authorised clearing approved an existing CAWS Act clearing licence under MS993 Yes □ No ⊠ in relation to this proposal? Has the applicant applied for, or have Licence/permit No: GWL175700

an existing RIWI Act licence or permit

in relation to this proposal?

File number: DER2022/000609

11

Yes □ No ⊠

	T	<u>, </u>
	Yes □ No ⊠	Name: N/A Type: Proclaimed Groundwater
Does the proposal involve a discharge of waste into a designated area (as		Area/Surface Water Area Has Regulatory Services (Water) been consulted?
defined in section 57 of the EP Act)?		Yes □ No □ N/A □
		Regional office: Swan Avon / Mid-West Gascoyne / Kwinana Peel / North West / South West / Goldfields / South Coast
		Name: N/A
le the Drawing cityeted in a Dyblic		Priority: P1 / P2 / P3 / N/A
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes □ No ⊠	Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)?
		Yes □ No □ N/A □
Is the Premises subject to any other Acts or subsidiary regulations (e.g. Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx)	Yes ⊠ No □	Health (Miscellaneous Provisions) Act 1911. Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974 Mining Act 1978 – Mining Proposal (Reg ID 87630 & 97061).
		5.55.7.
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes □ No ⊠	
Is the Premises subject to any EPP requirements?	Yes □ No ⊠	
Is the Premises a known or suspected contaminated site under the Contaminated Sites Act 2003?	Yes □ No ⊠	