Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

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

Works Approval Number	W2922/2025/1
Applicant	FMR Investments Pty Ltd
ACN	009 411 349
EO application number	APP-0026912
Premises	Barbara Surprise Project Lot 103 on Deposited Plan 40395 Certificate of Title Volume 2668 Folio 419 Great Eastern Highway, Coolgardie, WA 6429 As defined by the coordinates in Schedule 2 of the works approval
Date of report	11 April 2025
Decision	Works approval granted

Christine Pustkuchen

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MANAGER, RESOURCE INDUSTRIES
INDUSTRY REGULATION (STATEWIDE DELIVERY)
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W2922/2025/1 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 19 December 2024, the applicant applied to DWER for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction and time limited operations relating to dewatering activities at the Barbara Surprise Project (the premises). The application is seeking approval to construct and operate two new dewatering pipelines in stages:

- Stage 1: a 1 km dewatering pipeline from Bakers Flat to Surprise Pit; and
- Stage 2: a 0.5 km dewatering pipeline from Shirl Pit to Surprise Pit.

The premises relates to the category and assessed design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W2922/2025/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W2922/2025/1.

2.2.1 Overview of dewatering activities

In 2008, mining at the premises ceased. Since then, Bakers Flat Pit, Shirl Pit and Surprise Pit have flooded and developed pit lakes. Now, dewatering of up to 1,500,000 kilolitres (kL) per year is required to recommence mining of ore within Bakers Flat and Shirl pits.

The applicant will conduct dewater operations in two stages, commencing with Bakers Flat Pit lake into Surprise Pit then Shirl Pit lake to Surprise Pit. From Surprise Pit, water will be primarily supplied to the Greenfields Mill toll treatment facility (Greenfields Mill) via pipeline about 6.3 km northwest of the premises for mineral processing activities. The Greenfields Mill is owned and operated by the applicant under licence L4680/1988/13. Water will also be used for mining and dust suppression activities at Bakers Flat and Shirl pits.

2.2.2 Surprise Pit Water balance

In 2024, the applicant commissioned a Pit Lake Hydrogeological study from CMW Geosciences titled Barbara Surprise Mining Area – Pit Lake Hydrology Study (CMW, 2024) to determine whether Surprise Pit had sufficient capacity to store the proposed dewatering volumes generated as part of the planned mining of the Bakers Flat and Shirl Pits. The study determined Surprise Pit would maintain capacity given that dewatering from the two pits are staged and surplus water is sent to the Greenfields Mill.

Surprise Pit contains a pit lake volume of 34,434 kL and has a remaining capacity of 406,385 kL up to a 6 m below the pit crest. The volume of the Bakers Flat pit lake (389,000 kL) can be

contained within Surprise Pit and leave a 16 m freeboard. The applicant estimates that the initial transfer of water from Bakers Flat Pit would take two months at a rate of up to 300 cubic meters (m^3) per hour (Table 1). Pumping from Surprise Pit to Greenfields Mill will occur at the same time at a rate of 100 m^3 per hour. After the initial transfer of water, pumping in Bakers Flat Pit will be reduced to 10,160 kL per month for the purpose of managing groundwater infiltration. Surprise Pit will also continue to be pumped to maintain capacity for stage 2 dewatering operations.

During stage 2 operations, the applicant will transfer water from Shirl Pit to Surprise Pit. The pit lake volume in Shirl Pit (2,025,200 kL) exceeds the capacity of Surprise Pit (474,623 kL), therefore the applicant proposes to take two years to dewater at a continuous rate of up to 120 m^3 per hour (Table 1). At this rate, a 23 m freeboard will be maintained in Surprise Pit during and after the transfer of water from Shirl Pit. Pumping from Surprise Pit to Greenfields Mill will also occur at the same time at a rate of 100 m^3 per hour. After the initial transfer of water to Surprise Pit, pumping from Shirl Pit will be reduced a rate of 2,200 kL per month to manage water infiltration. Expected annual transfer and discharge volumes provided by the applicant are shown in Table 1 below.

Freeboard at Surprise Pit will be monitored by calculating the discharge water volumes against abstraction, evaporation and surface water inflow rates.

Losses due to pumping to the mill, evaporation and seepage to groundwater are expected to outweigh gains from precipitation, pits and groundwater inflows (Table 2). The applicant expects groundwater outflows from Surprise Pit when pit lake level is filled above pre-mining water levels (about 17.5 m below the pit crest). Losses to groundwater are expected to be about 75,000 kL over four months during stage 1 and about 217,000 kL over 32 months during stage 2. When water levels are below pre-mining water levels, groundwater is expected to flow back into the pit.

The water balance for Surprise Pit is summarised for each stage in Table 2 below, information summarised in Table 2 was provided by the applicant.

Table 1: Expected annual water transfers and discharge volumes

Year	Draw point	Mine use dewatering / dust suppression (kL)	Pit lake transfer (kL) (Months)
2025	Bakers Flat Pit	-102,000	-389,000[1]
	Shirl Pit	-18,000	0
	Surprise Pit	-12,000	+389,000[1]
	Total	**-132,000**	**-389,000**
2026	Bakers Flat Pit	-122,000	0
	Shirl Pit	-15,000	0
	Surprise Pit	-21,000	0
	Total	**-158,000**	**0**
2027	Bakers Flat Pit	-40,000	0
	Shirl Pit	-5,000	0
	Surprise Pit	-7,000	0

	Total	**-52,000**	**0**
2028	Bakers Flat Pit	0	0
	Shirl Pit	0	-1,037,000[2]
	Surprise Pit	0	+1,037,000[2]
	Total	0	**-1,037,000**
2029	Bakers Flat Pit	0	0
	Shirl Pit	0	-988,000[2]
	Surprise Pit	0	+988,000[2]
	Total	**0**	**-988,000**
2030	Bakers Flat Pit	-131,000	0
	Shirl Pit	-26,000	0
	Surprise Pit	0	0
	Total	**-157,000**	**0**

Note 1: Stage 1 initial transfer
Note 2: Stage 2 initial transfer

Table 2: Surprise pit net water balance

Water movement	Stage 1	Stage 2	Total (Stage 1 & 2 combined)
Inputs			
Pumped water in (m^3)	172,800	1,852,400	2,025,200
Groundwater inflows (m^3)	44,431	26,412	70,843
Precipitation (m^3)	5,690	8,985	14,675
Total Inputs			**2,110,718**
Outputs			
Groundwater outflows (m^3)	-75,368	-217,425	-292,793
Potential evapotranspiration (m^3)	-25,726	-52,591	-78,317
Mine use dewatering / dust suppression (kL)	-40,000	0	-40,000
Water supply to Greenfields Mill (m^3)	-393,370	-1,749,059	-2,142,429
Total Outputs			**-2,553,539**

2.2.3 Water quality

The water quality among all the pit lakes is similar. The pH levels are all above 7, ranging between pH 7.6 and pH 7.8. The salinities range between 92,000 and 120,000 mg/L total dissolved solids (TDS). Historical groundwater information indicates that the groundwater in the area can be hypersaline, up to 150,000 mg/L TDS. The salinity type is sodium chloride water with magnesium and sulphate present in lower concentrations. Heavy metals are low in concentration, while there are low concentrations of arsenic, manganese and nickel.

Due to the saline nature of the groundwater, it is currently only used for mining purposes. There are no other reported groundwater users in the area.

2.2.4 Dewatering infrastructure

Both Bakers Flat and Shirl pits will be dewatered using a pump on a floating pontoon.

Both dewatering pipelines will be 250 mm diameter PN16 high-density polyethylene (HDPE) as per AS/NZ Standards. They will be constructed using poly welding to join individual sections, with flanged control valves to direct flow between discharge points.

The pipelines will be located within earthen bunded corridors to contain leaks and spills. The pipelines will be fitted with isolation valves or automatic leak detection sensors. Pipelines will be inspected daily when in operation. If leaks or spills are observed from the pipeline or pumps, the pipeline will be shut down and repaired.

The pipelines will terminate either over the crest of Surprise Pit or down the pit ramp to reduce exposure to wind and prevent scouring of pit walls.

2.3 Other relevant approvals

2.3.1 Access Agreement with Northern Star Resources Limited

On 1 August 2024, an access agreement in the form of a Special Lease was granted by subsidiaries of Northern Star Resources Limited; Northern Star (Hampton Gold Mining Areas) Limited (land owner) and Northern Star (HBJ) Pty Ltd (the lessee). The Special Lease authorises the applicant access to Lot 103 on Deposited Plan 40395 Certificate of Title Volume 2668 Folio 419 (the premises) for the purposes of constructing, operating and maintaining the Barbara Surprise Pipelines to access the Barbara Surprise Pit water and provide the Greenfields Processing Site (Greenfields Site) with an alternative water source.

2.3.2 Department of Water

On 19 June 2024, the applicant applied to the department to amend groundwater licence GWL173070(5) (Application 065002) to authorise the abstraction of water from Bakers Flat Pit, Shirl Pit and Surprise Pit. Groundwater licence GWL173070(6) was granted to draw 1,500,000 kilolitres per annum from the Goldfields, Roe, Palaeochannel on 5 March 2025. It is the responsibility of the applicant to ensure all approvals are obtained.

3. Risk assessment

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

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this decision report are detailed in Table 3 below. Table 3 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 3: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Installation of dewatering pipeline	Air / windborne pathway	Water will be applied for dust suppression across mining operational activities.
Operation			

Saline mine water	Transfer of mine dewater between pits – pipeline leaks	Spills over land	• Pipelines will be constructed using materials that meet applicable Australian/New Zealand Standards including:
			  ○ AS/NZS 4129:2008 Fittings for polyethylene pipes for pressure applications;
			  ○ AS/NZS 4130:2009 Polyethylene pipes for pressure applications; and
			  ○ AS/NZS 4131:2010 Polyethylene compounds for pressure pipes and fittings.
			• Locate the dewatering discharge pipelines within earthen bunded corridors to ensure leaks or spills are contained;
			• Ensure that the discharge pipeline is located far enough over the Surprise Pit crest or down the pit ramp to reduce exposure to wind and prevent scouring of pit walls;
			• Fit dewatering pipelines with isolation valves or automatic leak detection sensors;
			• Undertake daily inspections (when in use) of the dewatering pipelines; and
			• Shutdown the required section of the pipeline system, if any leaks or spills from pumps or pipelines are detected, until the leak has been verified and/or repaired.

	Disposal into pit lakes	Groundwater mounding	Ensure that the Surprise Pit lake is below the maximum water level of 350 m AHD (i.e., 6 m below the surrounding ground surface).
		Overtopping	• Ensure that the Surprise Pit lake is below the maximum water level of 350 m AHD (i.e., 6 m below the surrounding ground surface);

Emission	Sources	Potential pathways	Proposed controls
			• Install flow meters and record the volume of water discharged each month: • Monthly monitoring of pit lake water level (freeboard capacity) and quality; and • If required, reduce discharge volumes into Surprise Pit and/or prioritise abstraction from Surprise Pit.
		Seepage	• Ensure that the Surprise Pit lake is below the maximum water level of 350 m AHD (i.e., 6 m below the surrounding ground surface); • Install flow meters and record the volume of water discharged each month: • Monthly monitoring of pit lake water level (freeboard capacity) and quality; and • If required, reduce discharge volumes into Surprise Pit and/or prioritise abstraction from Surprise Pit.

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 4 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 4: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Users of the Coolgardie Esperance Highway	1.4 km southwest of Shirl Pit. **Ruled out due to distance.**
Environmental receptors	**Distance from prescribed activity**
Native vegetation	Immediately outside the abandonment bunds of pits. Along the pipeline route.
Brown Lake Groundwater dependent ecosystem (GDE)	The GDE is 2 km east of Bakers Pit. The Brown Lake is 3.2 km north of Bakers Pit. The applicant hired CMW Geosciences Pty Ltd to complete a Pit Lake Hydrology Study for Barbara Surprise mining area. The report assessed the potential impacts from the abstraction of groundwater on Brown Lake. The assessment concluded that despite the planned inter-pit pumping and water transfers, the proposed water offtake by FMR from the groundwater system—at a rate of 2,400 m³/day (100 m³/hr nominal transfer rate to Greenfields Mill)—is calculated to be approximately 1.5 orders of magnitude lower than the average daily lake evaporation rate of around 43,750 m³/day at Brown Lake. As a result, the impact on the lake's water balance is considered minimal. **Ruled out due to distance.**
Groundwater	The ambient groundwater level at the premises is 338.5 mAHD, or between 13.5 to 40 meters below ground level (mbgl) within shallow paleochannels and deeper fractured-rock aquifers. Salinity has been recorded up to 150,000 mg/L TDS. The salinity of the pits lakes are within the natural range of the groundwater.

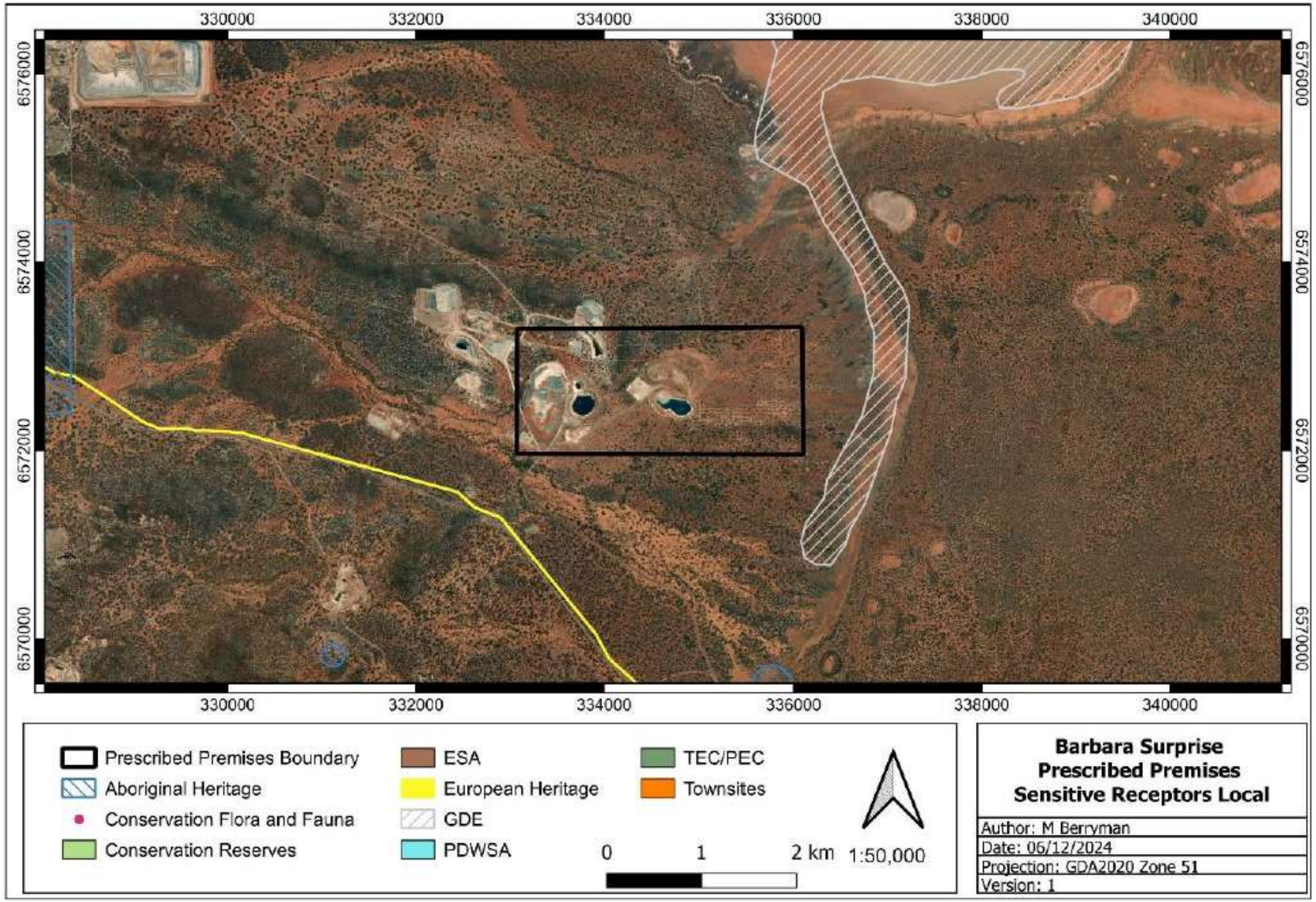

Figure 1: Distance to sensitive receptors

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 works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

Works approval W2922/2025/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 5 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

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

Table 5: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Dust	Installation of dewatering pipeline	**Pathway:** Air / windborne pathway **Impact:** Smothering of vegetation potentially impacting plant health	Native vegetation	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	N/A
Operation (including time-limited-operations operations)								
Transfer of mine dewater between pits	Saline mine water	**Pathway:** Direct discharge to land from pipeline leaks or rupture. **Impact:** Water inundation and salt intrusion impacting plant health.	Native vegetation	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1: Installation requirements Condition 6: Operational requirements Condition 7: Discharge point	The Delegated Officer has determined that the proposed controls (bunding, telemetry etc) will be sufficient to control impacts form pipeline spills. Applicants proposed controls have been conditioned in works approval.
Disposal into Suprise pit	Saline mine water	**Pathway:** Seepage into groundwater **Impact:** Mounding of the	Native vegetation Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 8: Freeboard requirement Condition 9: Discharge	The Delegated Officer has determined that the proposed controls will be sufficient to prevent groundwater

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
		groundwater table causing water inundation and salt intrusion of the root zone impacting plant health.					monitoring	mounding. Applicants proposed controls have been conditioned in works approval.
		Pathway: Overtopping **Impact:** Water inundation and salt intrusion of the impacting plant health.	Native vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 8: Freeboard requirement Condition 9: Discharge monitoring	The Delegated Officer has determined that the proposed controls (freeboard requirements) will be sufficient to prevent overtopping. Applicants proposed controls have been conditioned in works approval.

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

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

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 31 January 2024	None received	N/A
Shire of Coolgardie advised of proposal on 31 January 2024	None received	N/A
Applicant was provided with draft documents on 8 April 2025	On 9 April 2025, the applicant waived the comment period.	The comment period has been waived.

5. Conclusion

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

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. CMW Geosciences 2024, *Barbara Surprise Mining Area Pit Lake Hydrology Study*, Melbourne, Victoria.