Decision Report

Application for licence

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

Licence number	L9242/2020/1
Applicant	Paddington Gold Pty Limited
ACN	008 585 886
DWER file number	DER2020/000062
Premises	Golden Cities Mining tenements: M24/564, M24/565, M324/616, M27/185 and L24/231 As depicted in Schedule 1
Date of report	11 June 2020
Decision	Licence granted

1. Definitions

Key terms relevant to this decision report and their associated definitions are listed in Table 1.

Table 1: Definitions

Term	Definition
Applicant	Paddington Gold Pty Ltd
Category / categories	Categories of prescribed premises as set out in Schedule 1 of the EP Regulations.
Decision Report	refers to this document.
Delegated Officer	An officer delegated under section 20 of the EP Act.
Department	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 As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the *Public Sector Management Act 1994* and is responsible for the administration of the *Environmental Protection Act 1986* along with other legislation.
Emission	has the same meaning given to that term under the EP Act.
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Occupier	has the same meaning given to that term under the EP Act.
Prescribed premises	This has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Risk Event	As described in *Guidance Statement: Risk Assessment*

2. Overview of premises

Paddington Gold Pty Ltd (applicant) operates the Golden Cities (premises) which is located approximately 40 km north of the city of Kalgoorlie-Boulder within the Goldfields-Esperance Region.

The premises commenced activities in 2009 and went into care and maintenance in 2012. Currently no mining activities are taking place at the premises, with exception of active exploration and resource development drilling.

A works approval (W6244/2019/1) for the construction and commissioning of dewatering infrastructure and time limited discharge operations was issued by the Department of Water and Environmental Regulation (department) 1 August 2019. Proof of compliance with works approval conditions, was received by the department on 12 November 2019 and the Commissioning Report on 27 December 2019.

Table 2: Prescribed premises category

Category	Description	Assessed production or design capacity or throughput
Category 6	Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore	4 000 000 kL per year

2.1 Description of proposed activity

A licence application (application) was submitted by the applicant to the department on 31 January 2020 for dewatering activities from multiple mining pits (Figure 1).

The applicant proposes activities in the following stages:

- Dewatering from Federal South Pit and Federal North Pits to Havana, Jakarta or Mulgarrie Pits
- Dewatering from Jakarta Pit to Havana, Federal North/South and Mulgarrie Pits
- Dewatering from Havana Pit to Jakarta, Federal North/South and Mulgarrie Pits
- Dewatering from Mulgarrie Pit to Federal North/South
- Dewatering from Mulgarrie pit to Federal North/South Pit, Havana and Jakarta Pits

Transfer of water between pits will be determined by operational necessity.

The dewatering infrastructure has a design capacity of 4 000 000 kL/year, but is expected to be approximately 500 000 kL/year after the initial peak within the first 12 months of dewatering the Federal South Pit.

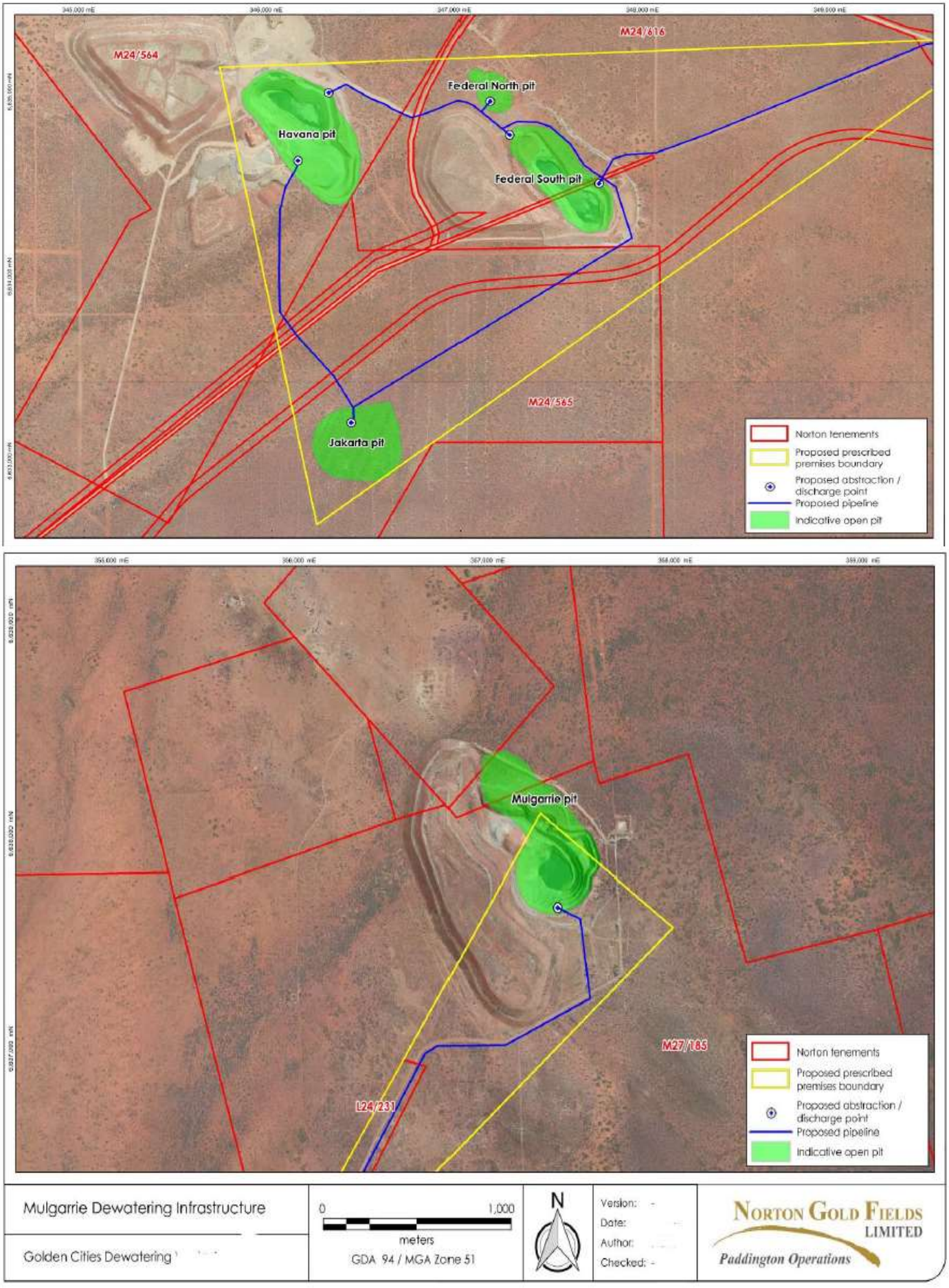

Figure 1 Dewatering infrastructure of the premises

The capacity of proposed and existing pits is outlined in Table 2.

Table 2 Volumetric capacity of existing and proposed pits

Existing pits	**Total capacity [m^3]**	**Current % of total capacity**
Havana	6 275 145	14
Federal South	2 442 242	36
Mulgarrie	6 201 393	8
Proposed pits	**Estimated total capacity [m^3]**	
Jakarta	2 081 999	
Federal North	1 008 000	

Relevant infrastructure for proposed dewatering operations are listed in and were constructed in accordance with W6244/2019/1.

Table 3 Infrastructure and equipment

Ref	**Infrastructure or Equipment**	**Site Layout Plan reference (Figure 1)**
1	Pipelines – potentially existing Poseidon pipeline from Federal South to Mulgarrie turnoff (8km) 4 km new pipeline from Mulgarrie turnoff to Mulgarrie pit New pipelines to be constructed between Federal (North and South), Havana and Jakarta.	Figure 1
2	V-drains	N/A
3	Scour pits	N/A
	Other activities	
4	Dewatering pumps	
5	Standpipe located north of Havana pit for water cart access	

3. Legislative context and other approvals

The legislative framework for this assessment is the *Environmental Protection Act 1986* (EP Act) and Environmental Protection Regulations 1987 (EP Regulations).

Relevant guidance documents are outlined in Appendix 1.

Approvals relevant to the premises are outlined in the table below.

Legislation	Number	Approval
Mining Act 1987	Mining Proposal Reg ID 79765	'Golden Cities Revised Version 2' approved on 4 July 2019. Mining Proposal to allow mining of the pits. Clearing Permit 8316/1 to cover required clearing for construction of dewatering pipeline within Premises Boundary, approved 2 March 2019.
Rights in Water and Irrigation Act 1914	GWL151865(11) Issued May 2020	Licence to abstract water 6 200 000 kL per year for earthworks and construction, dewatering for mining, dust suppression for mining purposes and mineral processing

4. Emission sources, pathways, receptors and controls

4.1 Emissions and pathways

The potential for emissions to impact on sensitive receptors has been assessed in accordance with the department's Risk Framework. The key emissions during premises operation which have been considered in this report are discharge of hypersaline water from dewatering activities.

The applicant has proposed measures to assist in controlling these emissions, where necessary. The control measures are outlined and have been considered when undertaking the risk assessment detailed in section 5.

Hypersaline water from dewatering activities may seep laterally from at the base of the pit, or discharge directly due to overtopping or pipeline rupture. This can cause adverse impacts on surrounding vegetation due to groundwater mounding and contamination with dissolved solids (salts).

These pathways have been considered in the risk assessment table in section 5.

4.2 Receptors

Risk is assessed as a combination of emission sources, the proximity and sensitivity of receptors to those emission sources and any pathways that can allow the emission to reach and potentially harm the receptor. Table 4 provides a summary of human and environmental receptors in proximity to the premises which have a potential to be impacted from site activities, and the risk assessment in section 0 considers these receptors in the context of emissions and potential pathways.

Table 4 Receptors

Human receptors	**Distance from activity or prescribed premises**	
Residential premises	The Broad Arrow town site is located approximately 12 km west of the premises. The Delegated Officer considers it unlikely that a Risk Event will occur given the significant distance, therefore this receptor is not further considered in the risk assessment.	
Environmental receptors	**Distance from activity / prescribed premises**	
Threatened/Priority fauna	Five threatened species of fauna and five migratory species of birds were identified as potentially occurring within the project area following a targeted Fauna and Malleefowl Survey carried out in 2017. 22 malleefowl mounds were located within the project area, two of which were found to be active. One is located 500m south west of the proposed Jakarta pit. The other, which is classed as 'recently active' is located approximately 100m south of the proposed Jakarta pit. Both are outside of the Premises Boundary. Malleefowl are listed as vulnerable under the *EPBC Act 1999*. Targeted malleefowl surveys were undertaken in the Golden Cities Project area in 2017 and 2018. Active mounds are currently undertaken, and activities associated with works are not with 100 m of active or potentially active mounds. A Malleefowl Management Plan and associated reporting and mound marking procedures are in place. During operations, this receptor is not considered to be impacted and therefore not further considered in the risk assessment.	
Groundwater and water	**Distance from activity / prescribed premises**	**Environmental value**
Salt lakes	An extensive salt lake system is located approximately 10 km south east of the premises. Surface water flows towards south east direction. The Delegated Officer considers it unlikely that a Risk Event will occur given the significant distance, therefore this receptor is not further considered in the risk assessment.	Salt lakes support a range of aquatic invertebrates and bird life. As they are mostly ephemeral, natural flood events play an important role with the hatching cycles of invertebrates which in turn provides a food source for flying fauna such as bats and birds.
Groundwater	Depth to groundwater varies significantly across the project area, ranging between 14 and 290 mbgl .	Total dissolved solids (TDS) range between 27,700 mg/L to 84,200 mg/L and pH ranges from 5.9 – 8.6. The high salinity of the groundwater means it is only utilised for industrial (mining) purposes and has no other beneficial use.

5. Risk assessment

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 5 below, consistent with the *Guidance Statement: Risk Assessments*. Risk ratings have been assessed for each key emission source and take into account potential source-pathway-receptor linkages. The mitigation measures / controls proposed by the applicant have been considered in determining the risk rating. The conditions in the issued licence as outlined in Table 5, have been determined in accordance with the *Guidance Statement: Setting Conditions.*

Table 5 Identification of emissions, pathway and receptors during operation

Risk Event				Consequence rating*	Likelihood rating*	Risk*	Reasoning	Regulatory controls
Source/Activities	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
Cat 6 Mine dewatering	Hypersaline water	Vertical seepage from pits resulting in groundwater mounding and impacting surrounding vegetation and root zone.	• Avoiding exceedance of maximum pit lake volume • monthly monitoring of pipeline flow meter and water level survey of the pits	Moderate	Possible	Medium	Refer to Section 5.1	Conditions 1, 3 and 4 in licence
		Overtopping of pits Direct discharge	• installation of markers at 6 m below crest level • groundwater management plan if water levels get close to 6 m mark	Moderate	Unlikely	Medium	Refer to Section 5.2	
		Pipeline rupture Direct discharge into environment affecting surrounding vegetation	• 12 hourly pipeline inspections • Regular maintenance • Containment bunds of sufficient size, directing water to mining void or catchment pit • Monitoring of water quality (EC, temperature, pH, TDS, metal suite) • Flowmeter with monthly readings • Isolation and breather valves	Moderate	Possible	Medium	Refer to Section 5.3	
		Seepage and infiltration through pit wall to groundwater	N/A	Slight	Possible	Low	Groundwater in the region is highly saline with major ions strongly dominated by sodium and chloride, and in smaller concentrations of magnesium and sulfate. Groundwater properties are not considered to have beneficial use, and is suitable for mining activities only.	N/A
Related activity	Hydrocarbons	Surrounding vegetation, contamination of land	• Appropriately designed and maintained truck • Waste management plan • Hydrocarbon management and spill procedure • Collection of waste oil and grease • Spill kits • Toolbox presentations to staff	Slight	Possible	Low	N/A	*Environmental Protection (Unauthorised Discharges) Regulations 2004* regulate discharges into the environment from business or commercial activities. Hydrocarbons stored in accordance with AS1940:2017 The storage and handling of flammable and combustible liquids. There is expected to be a slight consequence and it could occur at some time. The Delegated Officer considers it low risk.

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

5.1 Risk assessment – Groundwater mounding

Increasing localised groundwater mounding following discharge to the receiving Golden Cities pits may result in vegetation rootzones being inundated, with resulting poor health or death to native vegetation species.

5.1.1 Identification and general characterisation of emission

The emission is hypersaline groundwater, removed from various mined pits. TDS ranges between 27,700 mg/L to 84,200 mg/L and pH ranges from 5.9 – 8.6.

Vegetation roots that become saturated with hypersaline water can cause harm or death to the vegetation due to contamination with dissolved solids.

A vegetation survey of the project area was carried out in 2017 by Native Vegetation Solutions. The vegetation type is predominantly Eucalypt Woodland with a saltbush understory. The survey did not identify any threatened ecological communities, priority ecological communities, threatened or priority species within the survey area. Eucalypts are generally known to be shallow-rooted.

5.1.2 Applicant controls

The Applicant refers to a study that was carried out in 1999, which was an investigation into dewatering within the project area. It is stated that findings from the study showed there is insignificant and sporadic groundwater, and that water levels in the pits are expected to be low. To ensure the maximum pit lake volume is not exceeded, the Applicant has committed to monitor on a monthly basis the pipeline flow meters as well as water level surveys of all the pits.

5.1.3 Risk rating

If groundwater mounding occurs, then the Delegated Officer has determined that the impact of inundating rootzones will be a mid level on site impact. Therefore, the Delegated Officer considers the consequence of groundwater mounding to be **Moderate**.

The Delegated Officer has determined that the likelihood of groundwater mounding could occur at some time. Therefore, the Delegated Officer considers the likelihood of groundwater mounding to be **Possible.**

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 10) and determined that the overall rating for the risk of groundwater mounding during time-limited operation and normal operating conditions causing vegetation inundation is **Medium**.

5.2 Risk assessment – Overtopping of discharge pits

Overtopping of the receiving pits may occur if dewatering is not managed in conjunction with major rainfall events.

5.2.1 Identification and general characterisation of emission

The emission is hypersaline groundwater, removed from various mined pits. TDS ranges between 27,700 mg/L to 84,200 mg/L and pH ranges from 5.9 – 8.6.

Hypersaline water can contaminate surrounding soils with dissolved solids (salts) and can cause vegetation stress or death.

5.2.2 Applicant controls

The applicant has surveyed all of the pits which will be receiving points, which demonstrates available capacity to receive dewater. The applicant will be staging the dewatering through four stages, as described in section 4.1. This is to allow for water to be shifted for mining requirements whilst ensuring pit capacity is sufficient.

The applicant has also committed to not allowing water levels to rise above 6 m from the pit crest level. This will be monitored monthly and the pit capacity will be surveyed monthly.

5.2.3 Risk rating

If overtopping of the receiving pits were to occur, the Delegated Officer has determined that the impact of hypersaline water to native vegetation will cause mid-level on-site impacts. Therefore, the Delegated Officer considers the consequence of overtopping of pits to be **Moderate**.

The Delegated Officer has determined that the likelihood of an overtopping event would probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of overtopping to be **Unlikely**.

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix and determined that the overall rating of the risk of a pit overtopping event is **Medium**.

5.3 Risk assessment – Dewatering pipeline failure

Pipeline rupture or failure of the dewatering pipelines would result in the uncontrolled discharge of hypersaline water with the potential to impact on local soils and adjacent vegetation.

5.3.1 Identification and general characterisation of emission

The quality of the water in the vicinity of the project is considered hypersaline. The most recent samples of pH and TDS from within the pit lakes are shown in Table 6.

Table 6 Water quality of water in dewatering pits

Pit	pH	TDS (mg/L)
Federal South	5.9 – 8.0	78 700 – 84 200
Havana	8.3 – 8.6	34 800 – 37 100
Mulgarrie	7.6 – 8.4	27 700 – 57 200

Hypersaline water can contaminate surrounding soils with dissolved solids (salts) and can cause vegetation stress of death.

A vegetation survey of the project area was carried out in 2017 by Native Vegetation Solutions. The vegetation type is predominantly Eucalypt Woodland with a saltbush understory. The survey did not identify any threatened ecological communities, priority ecological communities, threatened or priority species within the survey area. Eucalypts are generally known to be shallow-rooted.

5.3.2 Applicant controls

The pipelines will be constructed in accordance with relevant Australian Standards and will be located within v-drains and earthern bunds. Inspections of the pipelines will also be carried out every 12 hours. Scour pits will be located at minimum 500m intervals with enough capacity to contain a spill in between routine inspections. Staff are trained to be aware and understand licence requirements and they have a Mine Dewatering Procedure which must be followed.

As an additional control, the applicant will install telemetry on the section of pipeline between Federal pit and Mulgarrie pit. The applicant has also committed to undertake monitoring of water quality annually to include pH, EC, TDS and metals and metalloids. It is important to monitor pH and TDS as acidic or more highly saline water may cause more rapid deterioration of the pumps and pipework, increasing the risk of water leakage.

5.3.3 Risk rating

If a pipeline rupture occurs, the Delegated Officer has determined that the impact of hypersaline water to native vegetation will cause mid-level on-site impacts. Therefore, the Delegated Officer considers the consequence of a pipeline rupture to be **Moderate**.

The Delegated Officer has determined that the likelihood of a pipeline rupture event could occur at some time. Therefore, the Delegated Officer considers the likelihood of pipeline ruptures to be **Possible.**

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix and determined that the overall rating of the risk of a pipeline rupture event during time-limited operation and normal operation is **Medium**.

6. Consultation

Method	Comments received	DWER response
Application advertised on DWER website (to 12 May 2020)	None received	N/A
Local Government Authority advised of proposal (20 April 2020)	None received	N/A
DMIRS advised of proposal (20 April 2020)	None received	N/A
Applicant referred draft documents (22 May 2020)	Comments received (5 June 2020), refer to Appendix 2 for details	

7. 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.

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Lauren Fox
A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES – ENVIRONMENT
An officer delegated by the CEO under section 20 of the EP Act

Appendix 1: Key documents

Document title	Availability
Licence application form and supporting documentation (February 2020)	DWER records (A1863794, A1863790)
Works approval (W6244/2019/1) Compliance documentation (December 2019) and confirmation (January 2020)	DWER records (DER2020/000062~1)
DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	accessed at www.dwer.wa.gov.au
DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	
DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	
DER, February 2017 *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	
DWER, June 2019 *Guideline: Decision Making* Department of Water and Environmental Regulation	

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder comment	DWER response
Condition 3	Applicant requests to specify monitoring frequency to be applicable in pits to which discharge is actively occurring	A note has been added to the condition to reflect the request from the applicant.
Condition 4	Applicant requests to specify inspection requirements to be applicable at infrastructure where discharge is actively occurring	A note has been added to the condition to reflect the request from the applicant.
Other corrections	**Summary of Licence Holder comment**	**DWER response**
Decision report Section 2.1	Applicant requests to amend description to be amended to the following: • Dewatering from Federal South Pit and Federal North Pits to Havana, Jakarta or Mulgarrie Pits; • Dewatering from Jakarta Pit to Havana, Federal (North/South) and Mulgarrie Pits; • Dewatering from Havana Pit to Jakarta, Federal (North/South) and Mulgarrie Pits, • Dewatering from Mulgarrie Pit to Federal (North/South), Havana and Jakarta Pits. The transfer of water between pits will be determined by operational necessity.	Updated in the Decision Report to reflect the description as requested by the applicant.
Decision report Section 4.1 and 4.2	Admin error referring to section 5	In text references have been updated and are now correct