



Concurrent application for Works Approval and Licence

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6072/2017/1
Applicant	Thunderbird Operations Pty Ltd
ACN	611 351 743
File Number	DER2017/001012
Premises	Thunderbird Mineral Sands Project – Preliminary works Great Northern Highway WATERBANK WA 6725 Legal description – Tenements M04/459, L04/82, L04/85 & L04/86
Date of Report	7 September 2017
Status of Report	Final

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1. Definitions of terms and acronyms

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

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Applicant	refers to the applicant, as specified at the front of this Decision Report
Application	refers to the documents and information submitted by the Applicant, as described in section 2.1 and listed in Table 2 of this Decision Report
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
Decision Report	refers to this document
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> 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 <i>Public Sector Management Act 1994</i> and is responsible for the administration of the <i>Environmental Protection Act 1986</i> along with other legislation
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
m ³	cubic metres
mbgl	metres below ground level
Minister	the Minister responsible for the EP Act and associated regulations
Mtpa	million tonnes per annum
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997</i> (WA)
PM	Particulate Matter
PM ₁₀	used to describe particulate matter that is smaller than 10 microns (µm) in diameter
Prescribed Premises	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
Primary Activities	as defined in Schedule 2 of the Works Approval
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>

2. Purpose and scope of assessment

Thunderbird Operations Pty Ltd (the Applicant) has submitted a new concurrent Application for works approval and licence under Division 3, Part V of the *Environmental Protection Act 1986* (EP Act) for preliminary works at its Thunderbird Mineral Sands Project.

This Decision Report sets out the Delegated Officer's assessment of risks arising from emissions and discharges that will be generated by the Prescribed Activities conducted during the preliminary works period at the Premises.

2.1 Application details

The Applicant proposes to undertake preliminary works within its Thunderbird mineral sands deposit footprint, in advance of the construction phase of the main Project (the Project). The Application was submitted on 13 June 2017.

The preliminary works will involve mining and processing up to 370,000 tonnes of material over an estimated 12 week period, to produce approximately 150,000 tonnes of ore. The first 60 rooms of the mining accommodation camp for the main Project (including supporting facilities) will also be constructed, to accommodate the required workforce during this period.

Table 2 lists the documents submitted during the assessment process.

Table 2: Documents and information submitted during the assessment process

Document/information description	Author	Date/version
Thunderbird Mineral Sands Project – Minor or Preliminary Works – M04/459 and L04/85 – Works Approval and Licence Application. Prepared for Sheffield Resources Limited	MBS Environmental	June 2017
Ownership of Thunderbird mining tenements – Letter confirming that following an internal restructure, the mining tenure of the Project is held by Thunderbird Operations Pty Ltd, as a wholly owned subsidiary of Sheffield Resources Limited	Sheffield Resources Limited	31 July 2017

3. Background

Thunderbird is a large scale heavy mineral sands mine proposed to be developed by the Applicant on the Dampier Peninsula within the west Kimberley region, approximately 75 km south-west of Derby and 90 km north-east of Broome.

The Project proposal is currently being assessed by the Environmental Protection Authority (EPA) at the level of Public Environmental Review.

On 27 July 2017, the EPA consented to the preliminary works being undertaken whilst the main Project proposal is being formally assessed. The preliminary works will cause the premises to become Prescribed Premises. Table 3 lists the prescribed premises categories that are applicable under Division 3, Part V in relation to the preliminary works.

Table 3: Prescribed Premises Categories

Classification of Premises	Description	Premises throughput (as per Application)
Category 8	Mineral sands mining or processing: premises on which mineral sands ore is mined, screened, separated or otherwise processed.	370,000 tonnes (preliminary works only)

The Application also included categories 85 (sewage facility) and 89 (putrescible landfill site) with respect to construction and operation of a small wastewater treatment plant and an initial landfill facility to support the mining accommodation camp during the preliminary works period:

- a mobile package wastewater treatment plant will be temporarily installed on the Premises to treat an estimated 11 cubic metres per day (m³/d) of wastewater generated by the 60 personnel over the 12 week period. The Delegated Officer has determined not to assess this activity, as the throughput falls below the prescribed premises threshold of 20 m³/d. This plant is to be replaced by a larger, permanent wastewater treatment plant (currently being assessed as part of the main Project proposal); and
- a small borrow pit will be excavated for road construction purposes, with the open trench used for disposing an estimated 18 tonnes of putrescible waste generated by the 60 personnel over the 12 week period. As this amount falls below the Prescribed Premises threshold of 20 tonnes per annum, this activity will also not be assessed as part of this Application. This landfill is to be expanded and is currently being assessed as part of the main Project proposal.

Key Findings:

1. Construction of the mining accommodation camp (i.e. the first 60 rooms and supporting facilities including an administration office area, kitchen and dining area, wet mess, laundry, potable water storage tanks, fuel tanks and recreational facilities), are not included in this assessment as they fall outside of the regulatory capture.
2. The mobile package wastewater treatment plant and landfill for the preliminary works period do not trigger the prescribed premises thresholds for categories 85 and 89 as set out under Schedule 1 of the EP Regulations. These activities are not included in this assessment as they fall outside of the regulatory capture.
3. DWER has advised the local government authority (Shire of Broome) that approvals required under the *Public Health Act 2016* will be the primary regulatory mechanism for the disposal of treated wastewater and solid wastes during the preliminary works period.

4. Overview of Premises

The Application seeks approval to undertake preliminary works within the Thunderbird deposit, in advance of the construction phase of the main Project. A summary of the Application is provided in Table 4.

Table 4: Summary of the Application

Element	Description
Premises name	Thunderbird Mineral Sands Mine
Mine status	Undeveloped 'greenfield' project
Commodity mined	Mineral sands
Life of mine	12 weeks
Land tenure	M04/459 is held exclusively by Sheffield Resources Ltd, of which the Applicant is a subsidiary company The land comprises pastoral lease held by a third party
Total material disturbed	370,000 tonnes
Ore quantity	150,000 tonnes
Mine waste	220,000 tonnes
HMC recovered	N/A – no on-site secondary processing
Pit depth	15 to 25 m below ground level

Area of disturbance	21.9 hectares
Clearing	21.9 hectares
Dewatering	Not required
Ore processing	Mobile screening plant will be used to dry screen material into three size factions, where samples will be taken. The remainder will be stockpiled for processing as part of the main Project

The Premises is located within Mining Lease M04/459, which is 4,525 ha in total area. This lease falls within the Mt Jowlaenga Pastoral Lease, which is held by a third party.

The total disturbance area (i.e. the test pits and disturbance areas required for access and mine infrastructure) is 19.92 ha. Table 5 provides a summary of the disturbance area by type over the mining lease, and a miscellaneous lease (L04/85) associated with the accommodation village.

Table 5: Area of disturbance by mining lease

Disturbance type	Mine activity reference	M04/459 (ha)	L04/85 (ha)
Test pits	Trench THTP005 (125 m x 75 m)	0.88	-
	Trench THTP006 (225 m x 125 m)	1.85	-
Stockpiles	Ore stockpile	0.98	-
	Waste dump	1.46	-
	Topsoil stockpile	1.02	-
	Pit design crest	2.45	-
Other infrastructure	Lay down	0.68	-
	Landfill	0.60	-
Village	Accommodation village	-	4.0
	Village access road	-	4.0
	WWTP and spray field	-	2.0
Total tenement area		9.92	10.0
Total mine activity area		19.92	

4.1 Preliminary works

4.1.1 Test pits

Two test pits will be developed within the footprint of the main Thunderbird deposit (Figure 1). A maximum of 370,000 tonnes in total will be mined from both pits (Table 6).

Table 6: Characteristics of proposed trenches

Test pit	Volume excavated (t)		Length (m)	Width (m)	Depth (m)
	Ore	Waste			
Trench THTP005	65,000	5,000	125	75	15
Trench THTP006	85,000	215,000	225	125	25

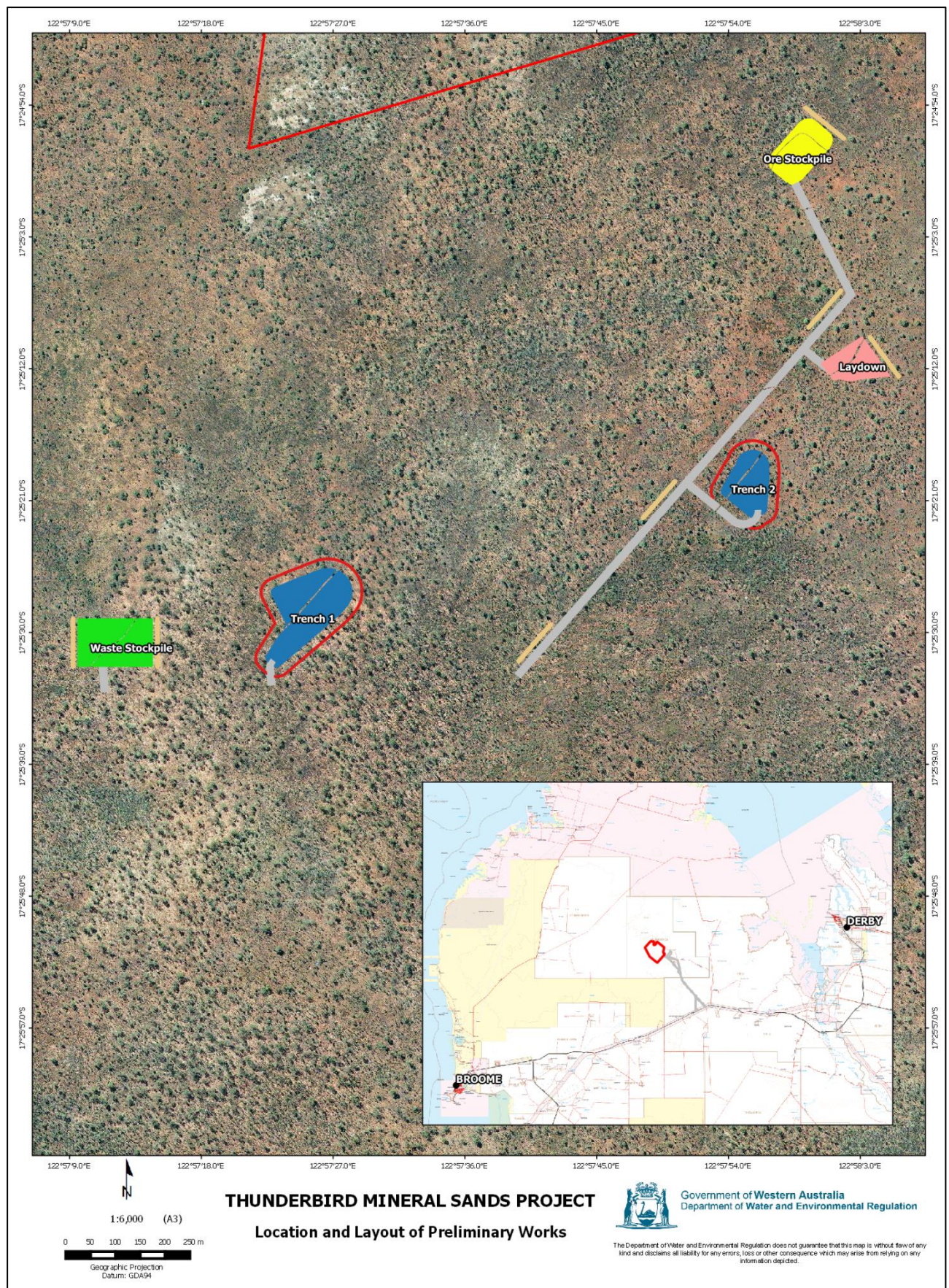


Figure 1: Location and site layout of the preliminary works

The mining process will include:

- Clearing of vegetation, stripping of topsoil and stockpiling for use in rehabilitation;
- Excavation of overburden and placement in stockpiles adjacent to the pit; and
- Mining of mineral sands ore and transfer of ore to stockpiles for screening.

Water required for dust suppression and screening activities will be obtained from existing groundwater bores that have previously been used to supply water for exploration purposes.

4.1.2 Processing of material

The excavated material will be screened using a portable grizzly¹ to initially screen off coarse oversize material (≥ 300 mm). A mobile screening plant will then be used to dry screen the undersize material (≤ 300 mm) into three size factions:

- -300 mm to +100 mm;
- -100 mm to +12 mm; and
- -12 mm to 5 mm.

Approximately 15,000 tonnes of each size faction will be screened and the undersize from this (~7,500 tonnes) will be used as samples to provide approximately 1,000 kg of representative material for off-site testing via a scrubber trommel unit. The remainder will be stockpiled, awaiting the outcome of the main Project proposal.

Approximately 15,000 tonnes of waste will be screened to determine the percentages of material that report to the size factions required for construction materials. Representative 100 to 150 kg samples from these size factions will be taken for off-site testing. The remainder will be stockpiled, awaiting the outcome of the main Project proposal.

4.2 Infrastructure

The proposed infrastructure, as it relates to Category 8 activities, is detailed in Table 7 and with reference to the Site Plan (attached in the Issued Works Approval).

Table 7: Thunderbird preliminary works infrastructure

Infrastructure	
Prescribed Activity Category 8	
Ore will be mined from two test pits and dry screened using a mobile screening unit, prior to stockpiling	
1	Excavator(s), front-end loader(s) and Moxy truck(s)
2	Grizzly screen
3	McCoskey screening plant
4	Ore and waste stockpiles
5	Water supply bore for dust suppression during excavation of the test pits and screening operations
Other activities	
1	Groundwater abstraction (95,000 kL/a) for potable water supply, dust suppression and screening operations

¹ Primary impact screen of a conventional screening plant, which sits above the hopper.

5. Legislative context

Table 8 summarises approvals relevant to the assessment.

Table 8: Relevant approvals and tenure

Legislation	Number	Approval
Part IV of the EP Act	Section 41A(3)	Consent to minor or preliminary works
<i>Mining Act 1978 (WA)</i>	-	Mining proposal yet to be submitted for M04/459
<i>Rights in Water and Irrigation Act 1914 (WA)</i>	GWL 182830(1)	Licensed allocation 95,000 kL/yr from the Canning-Kimberley Groundwater Area, Canning-Broome aquifer, for exploration purposes
<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>	Decision Notice EPBC 2017/7968	The proposed action (clearing of vegetation and development of two geotechnical investigation trenches and associated accommodation and road infrastructure) is not a controlled action

5.1 Part IV of the EP Act

5.1.1 Public Environmental Review

In November 2015, the Applicant referred the Project proposal to the EPA under section 38 of the EP Act. The EPA determined to assess the proposal at the level of Public Environmental Review in December 2015 and is yet to publish its assessment report.

5.1.2 Minor or preliminary works

In June 2017, the Applicant sought the EPA's consent to undertake minor or preliminary works under Section 41A(3) of the EP Act, which includes the works subject to the Application. On 27 July 2017 the EPA consented to the preliminary works, on considering the limited nature and disturbance (22 ha) of the works in comparison to the main Project proposal (1,635 ha).

After the EPA decides to assess a proposal, and before a decision or agreement is made under section 45 of the EP Act, DWER is prohibited from making a decision which would allow the proposal to be implemented, except in relation to minor or preliminary works which the EPA has consented may be implemented (section 41(4) and 41A(3)).

5.2 Other relevant approvals

5.2.1 Planning approvals

The Shire of Broome (Shire) has advised that development approval under the *Shire of Broome Local Planning Scheme No.6* is not required for the preliminary works proposal, including the accommodation village (considered incidental to the proposed mining operation).

The proposed package wastewater treatment plant will require approval from the Department of Health, with the application to be lodged with the Shire. The proposed putrescible landfill will not require approval from the Shire; however if managed poorly can be addressed as a nuisance under the *Public Health Act 2016*.

5.2.2 Mining Act 1978

With the exception of land alienated before 1 January 1899, all minerals² are the property of the Crown, and a mining title must be obtained from the Department of Mines, Industry Regulation and Safety (DMIRS) before ground disturbing exploration activities or any mining operations may be undertaken (DMP, 2015).

The Applicant is yet to submit a mining proposal to DMIRS, as the tenure for Mining Lease 04/459 is pending³, subject to a native title process.

5.2.3 Rights in Water and Irrigation Act 1914 (WA)

The Premises is located in the Canning-Pender sub-area of the Canning-Kimberley Groundwater Area. This sub-area encompasses the majority of the Dampier Peninsula (excluding the area near Broome) and has approximately 95% of its available groundwater resources available for allocation (DoW, 2010).

Groundwater abstraction in gazetted areas is regulated by DWER under section 5C of the RIWI Act. A License to Take Water has previously been issued from the Canning-Broome aquifer (95,000 kL/yr) to provide a source of water for exploratory drilling operations, mineral exploration activities and mining camp purposes. The Applicant intends to use this licence for supplying potable water to the mining accommodation camp, in addition to dust suppression during initial site works, prior to commencement of the operational phase of the Project.

5.2.4 Environment Protection and Biodiversity Conservation Act 1999 (Cth)

Due to the potential for threatened species and communities, to occur within the preliminary works area (such as the Greater Bilby), the Applicant referred the preliminary works proposal to the Department of the Energy and Environment for consideration under the EPBC Act.

The Minister for the Environment, taking into consideration the location of Greater Bilby activity in proximity to the proposed test pits and infrastructure, in addition to the management commitments made by the Applicant as listed in the Bilby Environmental Management Plan (BEMP) for the site, determined that the proposed action is not a controlled action (EPBC 2017/7968). Further assessment and approval under the EPBC Act is therefore not required before the works can proceed.

5.3 Part V of the EP Act

5.3.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations. The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory Principles (July 2015);*
- *Guidance Statement: Setting Conditions (October 2015);*
- *Guidance Statement: Licence Duration (August 2016);*
- *Guidance Statement: Environmental Siting (November 2016);*
- *Guidance Statement: Decision Making (February 2017); and*
- *Guidance Statement: Risk Assessment (February 2017).*

² When occurring on private land, the following are not considered minerals for the purposes of the Mining Act: limestone, rock, gravel, shale, sand and clay (excluding oil shale, mineral sands, silica or garnet sand, kaolin, bentonite, attapulgite and montmorillonite).

³ A mining proposal cannot be submitted to DMIRS until the tenure it relates to is 'live'.

5.3.2 Clearing of native vegetation

Under the EP Act, native vegetation can only be cleared with a clearing permit unless exempt. DMIRS has delegated authority under s20 of the EP Act to administer the native vegetation clearing provisions for mining activities regulated under the Mining Act.

Up to 19.92 ha of native vegetation is proposed to be cleared in total to facilitate the preliminary works. The proposed clearing is spread across the various tenements, with no more than 10 ha to be cleared in any one tenement.

6. Consultation

The Application was referred to the holder of the Mt Jowlaenga and Yeeda Pastoral Leases, in addition to several direct interest public authorities, conservation organisations and traditional landowners who made a submission on the PER for the main Project proposal. A summary of responses and the Delegated Officer's consideration is provided in Table 9.

Table 9: Direct interest stakeholder submissions and DWER consideration

Comment	DWER consideration
Department of Mines, Industry Regulation and Safety	
<p>DMIRS have not yet received a mining proposal for M04/459 as the tenure is not yet 'live'. The Applicant has submitted a mining proposal for its live tenure (Miscellaneous Licences 04/87, 04/85 and 04/86).</p> <p>Under the Mining Act, the Applicant cannot use any ground disturbing equipment to conduct mining operations unless approved via a programme of work or mining proposal. DMIRS is constrained under Section 41 of the EP Act from making any decision whilst the project is being assessed under Part IV, unless advice is received from DWER indicating the works are 'minor or preliminary'.</p>	Noted.
Department of Biodiversity, Conservation and Attractions	
<p>The preliminary works have the potential to have direct and indirect impacts on the bilby, which is known to be present in the area. As they are most active at night, it is recommended work is restricted to daylight hours or reduced on-site speed limits at night.</p> <p>The mitigation and management measures proposed by the Applicant are recommended to be conditioned as part of the Works Approval and Licence, including pre-clearance fauna surveys; pits remaining open overnight should be inspected by a fauna expert prior to the recommencement of works the following day; open pits should be backfilled prior to completion of the preliminary works; and bilby mortalities to be reported to DBCA.</p>	<p>DWER cannot condition for potential impacts on native fauna from vehicular movements on the Premises as it is outside the scope of Part V.</p> <p>The Delegated Officer notes the Minister for the Environment's determination under the EPBC Act (not a controlled action) was based upon implementation of the mitigation and management measures proposed by the Applicant in the BEMP. Failure to implement these measures would therefore void the Minister's determination.</p>

Shire of Broome	
<p>In consideration of s.120 of the Mining Act, development approval is not required from the Shire for mining operations on mining tenement.</p> <p>The Shire acknowledged DWER will not be regulating the temporary wastewater treatment plant and landfill during the minor preliminary works period, and advises the wastewater treatment plant will require approval under the Health Act (through the Shire). However, the landfill does not require Shire approval being on mining tenement. The Shire queried if the main wastewater treatment plant and landfill will be regulated by DWER.</p> <p>Given the above, the Shire of Broome raises no objections to the preliminary works application.</p>	<p>Noted.</p> <p>The Delegated Officer confirms the wastewater treatment plant and landfill for the main Project will be regulated under Part V.</p>
Traditional Landowner	
<p>A number of issues were raised relating to the environmental acceptability of the overall mining proposal.</p>	<p>The comments relate to the entire mining proposal rather than the minor and preliminary works.</p> <p>The issues raised will therefore be considered by the EPA as part of the assessment under Part IV of the EP Act.</p>
Pastoral lease holder	
<p>No response received within specified comment period.</p>	<p>N/A.</p>
Conservation Organisation(s)	
<p>No response received within specified comment period.</p>	<p>N/A.</p>

7. Location and siting

7.1 Siting context

The Premises is located on the western Dampier Peninsula in the State's Kimberley region, approximately half way between Derby and Broome.

The preliminary works site is located within the Mt Jowlaenga Pastoral Lease, a large cattle station characterised by sandplains and dunes with scattered hills and spinifex grasslands.

7.2 Residential and sensitive Premises

The distances to residential and sensitive receptors are detailed in Table 10.

Table 10: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Mt Jowlaenga homestead (unoccupied)	Approx. 8 km from preliminary works site
Nillibubbica designated rest area, Great Northern Hwy	Approx. 26 km from preliminary works site
Kimberley Meat Company	Approx. 26 km from preliminary works site
Bidan Aboriginal Community	Approx. 28 km from preliminary works site
Yeeda Outstation, Mt Jowlaenga Rd	Approx. 28 km from preliminary works site

7.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Table 11. Table 11 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem.

The table has also been modified to align with the *Guidance Statement: Environmental Siting*.

Table 11: Environmental values

Specified ecosystems	Distance from the Premises
Ramsar Sites in Western Australia	The closest site is Roebuck Bay, approximately 90 km south-west of the Premises
Important wetlands – Western Australia	The closest wetlands suite is the Roebuck Plains System, approximately 40 km south of the Premises
Parks and Wildlife Managed Lands and Waters	The closest is Coulomb Point Nature Reserve, approximately 60 km west of the Premises
Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs)	The closest mapped TECs are located along the coastline, approximately 80 km west of the Premises, including the Roebuck Bay mudflats, The closest mapped PECs include the Lowangan Land System (21 km east); Vegetation Association 67 (35 km south and north)
Biological component	Distance from the Premises
Threatened/Priority Flora	No declared rare or threatened flora pursuant to the WC Act or EPBC Act have been recorded within M04/459 Two Priority flora species have been recorded within M04/459 (none within the preliminary works footprint)
Threatened/Priority Fauna	Fauna surveys identified a number of conservation significant fauna species that have the potential to occur within M04/459 and surrounds Nine conservation significant fauna species were recorded in the wider survey area, with 3 recorded within M04/459, including the Greater Bilby, the Short-tailed Mouse and the Rainbow Bee-eater During a targeted Greater Bilby survey, over 750 records of Greater Bilby activity were recorded within proximity to M04/459

7.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 9.

Table 12: Groundwater and water sources

Groundwater and water sources	Distance from the Premises
Public drinking water source areas	The nearest Public Drinking Water reserves are near Broome and Derby, approximately 50 km and 75 km, respectively, from the Premises
Surface water catchments	The Premises is within the Fraser River catchment. The Logue and Little Logue River catchments are crossed by the site access road and do not contain any other project infrastructure There are no declared surface water areas within M04/459 or the

	Logue and Fraser River catchments
Major watercourses and waterbodies	The Fraser River is located approximately 7 km north of the Premises, with tributaries that extend down to the north of the Premises
	The headwaters of Fraser River South is located approximately 4 km south of the Premises
	The Fitzroy River is located approximately 71 km south-east of the Premises
Groundwater	Depth to groundwater over the test pits is around 36 to 38 metres The salinity in groundwater is low (110 – 200 mg/L TDS)

8. Risk assessment

8.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 14.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 13 and Table 14 below.

Table 13. Identification of emissions, pathway and receptors during construction

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Construction, mobilisation, positioning of infrastructure and other pre-mining works	Civil excavation/ earthworks/ vehicle movements on unsealed roads	Noise	No residences or other sensitive receptors in proximity	Air / wind dispersion	Amenity impacts/ human health impacts	No	Noise and fugitive dust impacting on human health/amenity has not been risk assessed as the closest human receptor is approximately 26 km from the Premises
		Fugitive dust			No		
			Vegetation, including riparian vegetation adjacent to the test pits		No	Dust loading on vegetation has not been risk assessed due to the short duration of the works. The Delegated Officer considers that any dust impacts that may occur can be regulated under the provisions of Section 49 of the EP Act	
	Clearing of native vegetation, topsoil stripping and O/B removal	Noise, fugitive dust	No residences or other sensitive receptors in proximity		Amenity impacts/ human health impacts	No	Clearing of native vegetation has not been risk assessed as it does not directly relate to the Primary Activity. The clearing of native vegetation is exempt if less than 10 ha per tenement per year
					Vegetation, including riparian vegetation adjacent to the test pits		

Table 14: Identification of emissions, pathway and receptors during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Category 8: Mineral sands mining or processing: premises on which mineral sands ore is mined, screened, separated or otherwise processed	Mining of material	Noise	No human residences or other sensitive receptors in proximity	Air / wind dispersion	Amenity impacts/ human health impacts	No	Noise has not been risk assessed as the closest human receptor is approximately 26 km from the Premises
		Fugitive dust			Soil contamination, suppression of photosynthetic and respiratory functions	No	Dust loading on vegetation has not been risk assessed due to the short duration of the works (12 weeks). The Delegated Officer considers that any dust impacts that may occur can be regulated under the provisions of Section 49 of the EP Act
			Vegetation, including riparian vegetation adjacent to the test pits				
		Oxidation of Acid Sulfate Soils from physical disturbance of ASS material	Groundwater, groundwater dependent vegetation	Leaching from in-situ material	Groundwater contamination (acidification)	No	ASS has not been risk assessed as the base of the test pits do not extend below the water table
	Screening of material into ore and waste	Noise	No human residences or other sensitive receptors in proximity	Air / wind dispersion	Amenity impacts/ human health impacts	No	Noise has not been risk assessed as the closest human receptor is approximately 26 km from the Premises
		Fugitive dust			Soil contamination, suppression of photosynthetic and respiratory functions	No	Fugitive dust has not been risk assessed with respect to potential impacts on human health/amenity, as the closest human receptor is approximately 26 km from the Premises
	Stockpiling of ore and waste		Vegetation, including riparian vegetation adjacent to the test pits				
		Contaminated stormwater	Surface waters, vegetation adjacent to the stockpile				

8.2 Consequence and Likelihood of Risk Events

A risk rating will be determined for risk events in accordance with the Risk Rating Matrix set out in Table 15 below.

Table 15: Risk Rating Matrix

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

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 16 below.

Table 16: Risk Criteria Table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> onsite impacts: catastrophic offsite impacts local scale: high level or above offsite impacts wider scale: mid-level or above Mid to long-term or permanent impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Specific Consequence Criteria (for public health) are significantly exceeded Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> onsite impacts: high level offsite impacts local scale: mid-level offsite impacts wider scale: low level Short-term impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Specific Consequence Criteria (for public health) are exceeded Local scale impacts: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Specific Consequence Criteria (for public health) are at risk of not being met Local scale impacts: mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> Specific Consequence Criteria (for public health) are likely to be met Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> onsite impact: minimal Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> Local scale: minimal to amenity Specific Consequence Criteria (for public health) met

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

* In applying public health criteria, DWER may have regard to the Department of Health's, *Health Risk Assessment (Scoping) Guidelines* "on-site" means within the prescribed premises boundary.

8.3 Acceptability and Treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk Treatment Table 17 below:

Table 17: Risk Treatment Table

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

8.4 Risk Assessment

The Delegated Officer has assessed potential emissions pathways and receptors for all possible Risk Events (Tables 13 & 14), and considers potential impacts will be limited by the short duration and remote location of the proposed works, and the absence of nearby sensitive receptors.

The Delegated Officer therefore considers the risks associated with the preliminary works to be Low, and that minor emissions such as fugitive dust and contaminated stormwater can be regulated by the general provisions of the EP Act.

The preliminary works will operate under an initial Works Approval and Licence that would be superseded by a separate Works Approval and Licence for the main Project proposal (currently being assessed by DWER). The works approval and licence for the main Project could only be granted if the Project is approved by the State Minister for Environment under Part IV of the EP Act and by the Commonwealth Minister for the Environment under the EPBC Act.

9. Determination of conditions

9.1.1 Works Approval conditions

The conditions in the issued Works Approval in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*.

A standard set of conditions has been added to the Works Approval detailing the works to be constructed. The duration of the Works Approval has been set at 3 years, being the standard time allocation within which works should be completed.

Table 18 provides a summary of the conditions to be applied to this works approval.

Table 18: Summary of conditions to be applied on the Works Approval

Condition Reference	Grounds
Infrastructure and Equipment Conditions 1, 2, 3 and 4	These conditions are valid, risk-based and consistent with DWER's <i>Guidance Statement: Decision Making</i> .
Emissions Condition 5	This condition is valid, risk-based and consistent with the EP Act.
Record-keeping	These conditions are valid and are necessary administration and

Conditions 6 and 7	reporting requirements to ensure compliance.
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The appropriateness and adequacy of controls may be reviewed at any time and following a review, DWER may initiate amendments to the works approval under the EP Act.

9.1.2 Licence conditions

The following controls (Table 19) will be imposed as conditions on the proposed Licence to manage the risk of emissions during operations on the Premises. It should be noted that these controls are not final and will be subject to compliance with conditions of the Issued Works Approval and may change if additional information becomes available to further inform the risk assessment (as per *Guidance Statement: Risk Assessments*).

Table 19: Summary of conditions to be applied on the proposed Licence

Condition Reference	Grounds
Emissions Condition 1	This condition is valid, risk-based and consistent with the EP Act.
Infrastructure and Equipment Condition 2	This condition is valid, risk-based and contains appropriate controls to minimise fugitive dust levels.
Information and reporting Conditions 3, 4, 5 and 6	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

10. Applicant's comments

The Applicant was provided with the draft Decision Report and draft issued Works Approval on 1 September 2017 and made no additional comments.

11. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Issued Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Tim Gentle

Manager Licensing – Resource Industries

Delegated Officer

under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Thunderbird Mineral Sands Project – Minor or Preliminary Works – M04/459 and L04/85 – Works Approval and Licence Application.	Application	DWER records (A1449925)
2.	DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
3.	DER, October 2015. <i>Guidance Statement: Setting Conditions</i> . Department of Environment Regulation, Perth.	DER 2015b	
4.	DER, November 2016. <i>Guidance Statement: Environmental Siting</i> . Department of Environment Regulation, Perth.	DER 2016	
5.	DER, February 2017. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER 2017a	
6.	DER, February 2017. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER 2017b	
7.	DMP, October 2015. <i>Mining Act Guidelines – Basic Provisions</i> . Department of Mines and Petroleum, Perth.	DMP 2015	accessed at www.dmp.wa.gov.au
8.	DoW, December 2010. <i>Kimberley Regional Water Plan 2010 – 2030</i> . Department of Water, Perth.	DoW 2010	accessed at www.water.wa.gov.au
9.	Referral Decision – Thunderbird Mineral Sands Project, minor and preliminary works, WA (EPBC 2017/7968). Department of the Environment and Energy.	EPBC 2017/7968	accessed at www.epbcnotices.environment.gov.au

Attachment 1: Issued Works Approval W6072
