



Application for Works Approval Amendment

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

Works Approval Number	W6594/2021/1
Works Approval Holder	Mardie Minerals Pty Ltd
ACN	152 574 457
File Number	DER2021/000356
Premises	Mardie Project G08/101, G08/93, L08/193, L08/233, M08/525, M08/526, M08/527 and M08/539 MARDIE WA 6714 As defined by the Premises map attached to the Revised Works Approval
Date of Report	29 April 2024
Proposed Decision	Intent to grant revised works approval

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

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1. Decision summary

Works Approval W6594/2021/1 is held by Mardie Minerals Pty Ltd (Works Approval Holder) for the Mardie Project (the Premises).

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, Revised Works Approval W6594/2021/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department 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

On 9 October 2023, the Works Approval Holder submitted an application to the department to amend Works Approval W6594/2021/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought as part of the Mardie Optimised Project:

- Expansion of the prescribed premises boundary;
- Increased throughput, including:
 - Primary seawater intake rate of 180 GL/a (increase of 30 GL/a);
 - Brine discharge rate of 5.5 GL/a (increase of 1.9 GL/a);
 - Increased export quantities to 5.35 Mtpa of salt and 140 ktpa of sulphate of potash (SoP) (average);
- Inclusion of a secondary seawater intake option within Mardie Creek (additional to the secondary saltwater intake on the jetty approved under W6594/2021/1);
- Changes to the size and location of evaporation and, salt and Kainite-Type-Mixed Salts (KTMS) crystalliser ponds;
- Increase in the number of salt and KTMS crystalliser ponds;
- Construction and operation of a putrescible landfill facility; and
- Changes to pond wall design.

This amendment is primarily limited to changes to Category 14 activities authorised under the existing works approval. Category 89 is an addition to the Works Approval.

Table 1 below outlines the proposed changes to prescribed premises categories.

Table 1: Proposed design or throughput capacity changes

Category	Current design throughput capacity	Proposed design throughput capacity	Description of proposed amendment
14	4,400,000 tonnes per annual period of salt 140,000 tonnes per annual period of sulphate of potash (SOP)	Design capacity 6,800,000 tonnes per annual period of salt (expected throughput 5,350,000 tonnes per annual period of salt) Design capacity 180,000 tonnes per annual period of SOP (expected throughput 140,000 tonnes per annual period of SOP)	Project optimisation resulting in increases in the production of salts and SoP.
89	N/A	2,880 tonnes per year	Inclusion of new landfill for the disposal of Putrescible and Inert Waste Type 1 waste types.

2.2.1 Putrescible Landfill

A landfill is to be established for waste management at the Optimised Mardie Project. It will consist of 70 unlined, earthen cells (trenches) designed to accept Putrescible and Inert Waste Type 1 waste types. The cells will be arranged in five banks each with 14 cells. The landfill will be designed and operated in accordance with the *Environmental Protection (Rural Landfill) Regulations 2002*. Refer to Figure 1 for the Landfill Facility design.

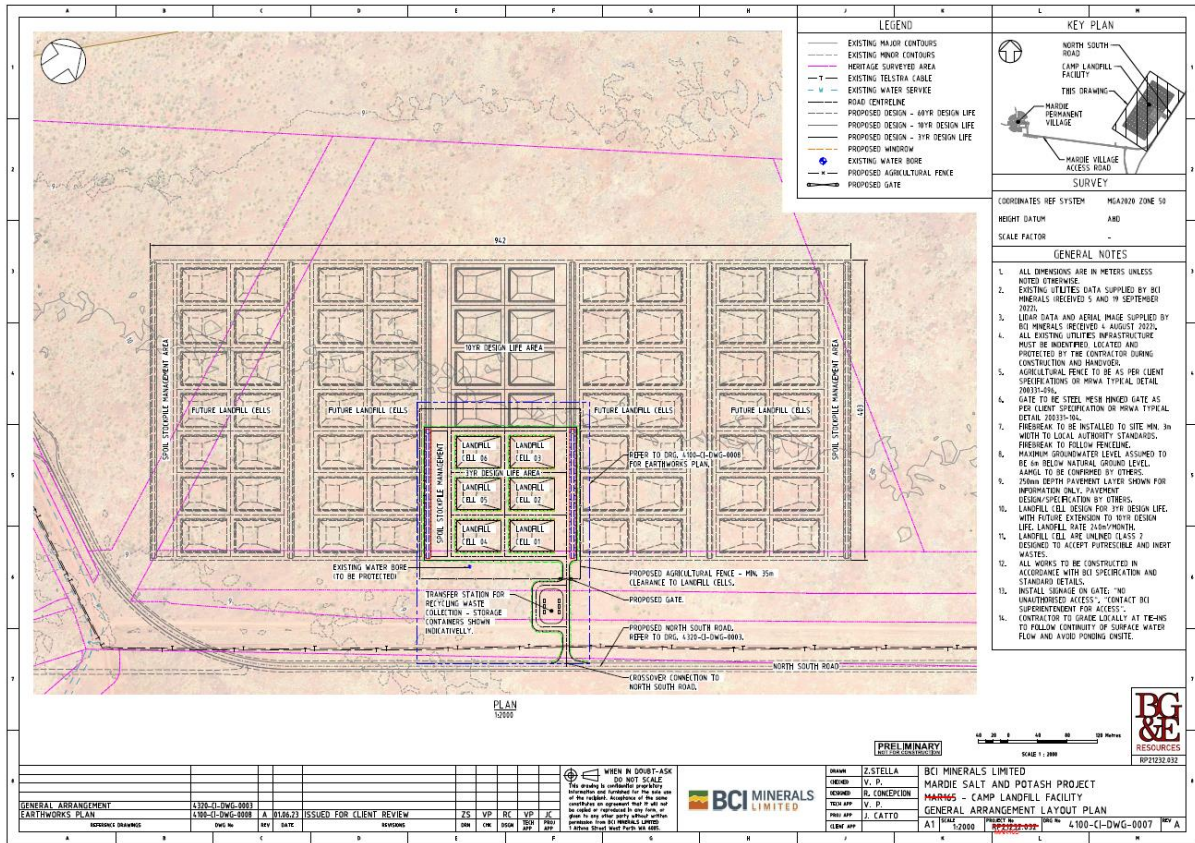


Figure 1: Landfill Facility

2.3 Part IV of the EP Act

The Mardie Project was referred to the EPA on 30 May 2018 for assessment under Part IV of the EP Act.

Ministerial Statement 1175 was published on 24 November 2021.

The Works Approval Holder referred the Optimised Proposal to the EPA and it was assessed under Part IV of the EP Act at the level of Assessment on Referral Information (EPA Assessment No. 2336). EPA services released EPA Report 1740 on 19 June 2023. Ministerial Statement 1211 was published on 19 October 2023 and includes the following:

- Conditions B3-2 and B3-3 require a Groundwater Monitoring and Management Plan for the evaporation and crystallizer ponds, which includes establishing monitoring bores, seepage recovery actions and implementing trigger criteria; and
- Conditions B4-2 and B4-3 require a Marine Environmental Quality Monitoring and Management Plan, which includes the levels of ecological protection to be met, establishing a monitoring program and implementing trigger criteria.

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 Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Works Approval Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Works Approval Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Category 14			
Dust	Vehicle movement, excavation, and construction machinery in pond construction	Air / windborne pathway	<ul style="list-style-type: none"> Minimise clearing of vegetation to prevent dust occurrence; Water will be applied to any roads or cleared areas that pose a dust risk; Areas will not be disturbed until they are required to be used, and the area to be disturbed will be minimised where practicable; Use magnesium compounds as dust suppressants where applicable; Opportunistic inspections for dust emissions will be undertaken during construction to ensure dust control measures are being implemented and are effective; and If visible dust emissions are noted then an assessment of the source will be made and additional water will be applied to key source areas, or alternative treatments will be applied.
Noise and vibration	Vehicle movement, excavation and construction machinery	Air / windborne pathway	<ul style="list-style-type: none"> Most of the works will be conducted in narrow strips on soft mudflats (for the pond walls) and minimal night work will be conducted due to site terrain; Noise monitoring will be conducted at Mardie Station Homestead if complaints occur, as required by the station owners; and An incident reporting system will be maintained to assist in managing environmental incidents such as excessive noise emissions.
Chemicals and hydrocarbons	Construction areas	Direct discharges due to	<ul style="list-style-type: none"> Spill kits located at primary construction sites and within service

Emission	Sources	Potential pathways	Proposed controls
		spills/leaks	vehicles; <ul style="list-style-type: none"> Any spills controlled, contained and cleaned up; Hydrocarbons and chemicals stored within suitably bunded areas; Spill kits regularly checked and replenished if required; and Hydrocarbon and chemical spills recorded.
Category 89			
Dust	Vehicles, machinery	Air/windborne pathway	<ul style="list-style-type: none"> No visible dust will escape from the landfill site.
Noise	Vehicles, machinery	Air/windborne pathway	<ul style="list-style-type: none"> Construction of the landfill is not expected to significantly increase noise emissions.
Contaminated stormwater	Rainfall	Direct discharges	<ul style="list-style-type: none"> 4 m table drain will be installed to ensure stormwater and spoil run off is contained; and Stormwater from the operating cells will be contained by the cell excavation itself (the cells will not be free draining).
Dark smoke	Fires	Air/windborne pathway	<ul style="list-style-type: none"> A 3 m firebreak will be installed;
Debris attracting stock and other fauna	Windblown	Air/windborne pathway	<ul style="list-style-type: none"> Landfill site will be fenced, with a minimum requirement being a stock fence; and The fence will be located more than 35 m from the landfill cells.
Leachate	Seepage through base of landfill cells	Infiltration	<ul style="list-style-type: none"> The base of the landfill cells will be more than 3 m above the highest groundwater levels at the site.
Commissioning and Operations (including time-limited-operations operations)			
Category 14			
Dust	Increased export quantities to 5.35 Mtpa of salt and 140 ktpa of SoP (average)	Air/windborne pathway causing impacts to health and amenity	<ul style="list-style-type: none"> Water will be applied to any roads around the SOP plant or cleared areas that pose a dust risk; Use magnesium compounds as dust suppressants where applicable; SOP processing is predominantly a wet process, products are dewatered

Emission	Sources	Potential pathways	Proposed controls
			<p>to a moisture content of <7.5% w/w;</p> <ul style="list-style-type: none"> SOP products are stockpiled dry <0.5% w/w and are sized between 2 mm and 4.5 mm and the Applicant has advised they are unlikely to produce excessive dust; Salt products are stockpiled wet 4 – 5% w/w and the Applicant has advised they are unlikely to produce excessive dust; The SOP storage shed is equipped with a dust extraction system that reports to a baghouse; and Off-gas from the SOP drying area has a dust extraction cyclone and the SOP compaction plant has a dust baghouse prior to venting to atmosphere, captured dust is reintroduced to the processing circuit.
	Changes to the size and location of evaporation and, salt and Kainite-Type-Mixed Salts (KTMS) crystalliser ponds	Air/windborne pathway causing impacts to health and amenity	<ul style="list-style-type: none"> Opportunistic inspections for dust emissions will be undertaken during commissioning and operation to ensure dust control measures are being implemented and are effective; If visible dust emissions are noted then an assessment of the source will be made and additional water will be applied to key source areas, or alternative treatments applied;
	Increase in the number of salt and KTMS crystalliser ponds	Air/windborne pathway causing impacts to health and amenity	<ul style="list-style-type: none"> The potential for high-risk weather conditions for dust emissions (i.e. windy conditions) will be monitored and extra water applied in preparation; and An incident reporting system will be maintained to assist in managing environmental incidents such as excessive dust emissions.
Light	Lighting structures on infrastructure	Emitted from lighting structures	<ul style="list-style-type: none"> All external lighting targeted where possible, using shields and directional lighting to minimise light spill beyond the required work area; and External lighting will use, where possible, red or low-pressure sodium lights. Bright white lights such as mercury vapour, metal halide or florescent will be avoided where possible. <p>Note only light impacts to Mardie Station Homestead are assessed by Part V of the EP Act as Illumination Plan</p>

Emission	Sources	Potential pathways	Proposed controls
			for marine and terrestrial fauna is required as per Ministerial Statement 1211.
Noise	Increased throughput and inclusion of additional salt and KTMS crystalliser ponds	Air/windborne pathway causing impacts to health and amenity	<ul style="list-style-type: none"> The Secondary Crystallisers can only be harvested by chemically redissolving the crystallised salt with fresh seawater, as opposed to tractor harvesting; and The KTMS Crystallisers are only harvested during daytime hours (7:00am – 7:00pm).
Brine	Changes to pond wall design	Unintentional discharge through spills/leaks from overtopping or pipeline ruptures	<ul style="list-style-type: none"> Updated seawall design takes advantage of improvements in the cyclone event modelling and physical flume testing to produce an optimised rock armour design for the seaside of the embankment. The Mining Proposal for the Optimised Mardie Project has been approved by DEMIRS; All embankments inspected prior to filling with brine to ensure they meet the design specifications and do not contain structural faults; Stability of embankments inspected on a regular basis during commissioning and operations and following significant weather events; Interconnecting pipework and pumps installed at ground level where possible; Pipe crossings of roads double contained with trafficable lids to facilitate spill and leak detection; and Bitterns piping is designed to be located within the operational footprint of the ponds/processing plant.
	Increased throughput primary seawater intake, inclusion of salt and KTMS crystalliser ponds and brine discharges	Leachate through base and embankments of ponds	<p>Implement the Groundwater Monitoring and Management Plan as per Ministerial Statement 1211.</p> <p>Screened out as regulated by Part IV of the EP Act</p>
Bitterns	Increased throughput primary seawater intake, inclusion of salt and KTMS crystalliser ponds and brine	Discharge through diffuser at end of trestle jetty of the Mardie	<p>Implement the Marine Environmental Quality Monitoring and Management Plan as per Ministerial Statement 1211.</p> <p>Screened out as regulated by Part IV of the EP Act</p>

Emission	Sources	Potential pathways	Proposed controls
	discharges	Port Facility	
Odour	Increased number of salt and KTMS crystalliser ponds	Air/windborne pathway causing impacts to health and amenity	As Mardie Station Homestead is located 4.5 km east of the ponds, odour is not expected to impact and is, therefore, screened out.
Chemicals and hydrocarbons	Areas where stored and transferred	Direct discharges due to spills/leaks	<ul style="list-style-type: none"> • Spill kits located at fuel storage areas and within service vehicles; • Any spills controlled, contained and cleaned up; • Hydrocarbons and chemicals stored within suitably bunded areas; • Spill kits regularly checked and replenished if required; and • Hydrocarbon and chemical spills recorded.
Contaminated stormwater with salt	SOP and salt stockpiles due to increased export quantities	Stormwater runoff	Implement the Groundwater Monitoring and Management Plan as per the Ministerial Statement 1211. Screened out as regulated by Part IV of the EP Act.
Landfill			
Dust	Vehicles, machinery	Air/windborne pathway	<ul style="list-style-type: none"> • No visible dust will escape from the landfill site.
Noise	Vehicles, machinery	Air/windborne pathway	<ul style="list-style-type: none"> • Operation of the landfill is not expected to significantly increase noise emissions.
Contaminated stormwater	Rainfall	Direct discharges	<ul style="list-style-type: none"> • Landfill will be managed to ensure that: <ul style="list-style-type: none"> ➢ Waste does not get washed away, or blown, outside the site; and ➢ Waste that has been washed away, or blown, away from the tipping area of the site is returned to the tipping area at least once in each month.
Chemicals and hydrocarbons	Use of fuels, contaminated wastes	Direct discharges	<ul style="list-style-type: none"> • No fuels stored at the landfill; and • Only Putrescible and Inert Waste Type 1 waste types accepted.
Dark smoke	Fires	Air/windborne pathway	<ul style="list-style-type: none"> • No waste will be burnt at the landfill; • Appropriate procedures in force onsite

Emission	Sources	Potential pathways	Proposed controls
			<p>to ensure that:</p> <ul style="list-style-type: none"> ➤ Any unauthorised fire on site will be promptly extinguished; ➤ Appropriate alarm and evacuation procedures are in place; and ➤ Report provided within 14 days of a fire including: <ul style="list-style-type: none"> ▪ details of the date, time and location of the fire; ▪ the time the location of the fire was declared safe by the Fire Control Officer for the site; and ▪ the cause, or suspected cause, of the fire.
<p>Odour</p> <p>Debris attracting stock and other fauna</p>	<p>Windblown</p>	<p>Air/windborne pathway</p>	<ul style="list-style-type: none"> • Tipping area of the landfill will be not greater than: <ul style="list-style-type: none"> ➤ 30 m in length; and ➤ 2m above ground level in height; • Waste in the tipping area of the site will be totally covered so that no waste is left exposed, weekly with a dense, inert and incombustible material, or such other material as is approved in respect of a particular landfill site; and • Landfill will be managed to ensure that: <ul style="list-style-type: none"> ➤ Waste does not get washed, or blown, outside the site; and ➤ Waste that has been washed, or blown, away from the tipping area of the site is returned to the tipping area at least once in each month.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Works Approval Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

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

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

Human receptors	Distance from prescribed activity
<p>Mardie Station Homestead and woolshed complex is a European Heritage site and is occupied on a continual basis.</p> <p>There is an Access Deed between the Applicant and Pastoral Management Pty Ltd (the leaseholder)</p>	<p>250 m from closest project infrastructure (pond embankment).</p>
Environmental receptors	Distance from prescribed activity
<p>Threatened Ecological Communities and Priority Ecological Communities</p>	<p>Phoenix (2018) states the no Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) listed under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) or <i>Wildlife Conservation Act 1950</i> (WC Act) are present within the Mardie Project area.</p> <p>The Horseshoe Flat PEC is a regionally significant grasslands of the Roebourne Plains. Baseline flora and vegetation surveys has identified that the vegetation inland of the Benthic Communities and Habitats (BCH) is dominated by Horseshoe Flat PEC like vegetation. As a result, the Mardie Project has been located to maximise the use of the mud/salt flats and minimise potential impacts to potential Horseshoe Flat PEC.</p> <p>The BCH both intertidal and subtidal include the mud/salt flats, algal mats, mangroves, tidal creeks and sub tidal flora and fauna. Baseline studies to identify the extent of these communities and their ecological values have been undertaken. As a result, the Mardie Project has been located to maximise the use of the mud/salt flats and avoid the more sensitive algal mats, mangroves, tidal creeks and sub tidal flora and fauna were possible</p>
<p>Threatened/Priority Fauna</p>	<p>Phoenix (2018) reported that the following were not identified in the survey but may exist in the Mardie Project area:</p> <ul style="list-style-type: none"> • Lakeland Down Mouse (Leggadina lakedownensis) - Priority 4; • Fork-tailed Swift (Apus pacificus) - Migratory bird; • Grey Falcon (Falco hypoleucos) – Vulnerable; and • Peregrine Falcon (Falco peregrinus) - Specially Protected Fauna. <p>Baseline flora and fauna studies have been carried out over the project area and surrounding areas. The location of the proposed ponds avoids most of the conservation significant flora and fauna located and several exclusion zones have been set up within the Prescribed Premises</p>

	<p>Boundary were conservation significant flora and fauna can be avoided. Disturbance to conservation significant flora and fauna is assessed under Part IV of the EP Act.</p>
<p>Groundwater</p>	<p>The Applicant reports that the depth to groundwater varies between 0.3 – 0.8 m below ground level (mbgl), with salinity up to three times the level of seawater and ranging from 130,000 – 210,000 microsiemens per centimetre ($\mu\text{S}/\text{cm}$).</p> <p>The nearest bore lies approximately 2 km southeast of the Mardie Project area based on DWER's data.</p> <p>Water is not used for potable or industrial use.</p> <p>Marine water inundation occurs on the Premises.</p>
<p>Major watercourses or waterbodies</p>	<p>The Indian Ocean lies approximately 5 km from the Mardie Project ponds. The inlet from which seawater is to be drawn is 4.5 km north of the Mardie Project ponds. The Mardie Project area lies within the Saline Coastal Flat.</p> <p>Marine and mangrove ecosystems.</p> <p>Mardie Pool is a permanent water hole providing freshwater year-round and important ecologically and as a heritage site. Mardie Pool has been excluded from the Prescribed Premises Boundary and is 180 m from the nearest crystalliser ponds</p>
<p>Heritage sites</p>	<p>The Yaburara Mardudhunera (YM) People and Kuruma Mardudhunera (KM) People are the Traditional Owners associated with the land that underlies the project. Mardie Minerals holds fully executed Land Access Deeds with both the YM People and the KM People. Extensive Heritage Survey work has been conducted and sites identified. Mardie Minerals is working with the Traditional Owners to avoid heritage sites where possible, salvage material where practicable and applying for Section 18 approval to disturb sites where it is not practicable. As mentioned above Mardie Pool is of significance to the Traditional Owners and has been excluded from the Prescribed Premises Boundary.</p>

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Works Approval Holder 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 Works Approval Holder'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 Works Approval Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

The Revised Works Approval W6594/2021/1 that accompanies this Amendment Report authorises construction and time-limited operations. The conditions in the Revised Works Approval 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. Category 14 and 89 activities. A risk assessment for the operational phase has been included in this Amendment Report, however licence conditions will not be finalised until the department assesses the licence application.

Table 4. Risk assessment of potential emissions and discharges from the Premises during construction, commissioning and operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
Construction								
Category 14								
Vehicle movement, excavation and construction machinery and landfill construction	Dust	Air/windborne pathway causing impacts to health and amenity	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	Condition 1, Table 1 Design and construction / installation requirements Requires dust controls to be implemented during the construction phase, such as minimising disturbance areas and using adequate dust suppression.	N/A
	Noise and vibration			Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	N/A	N/A
	Hydrocarbons and chemicals	Direct discharges from spills/leaks	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	N/A	N/A
Category 89								
Vehicles, machinery	Dust	Air/windborne pathway	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	N/A	N/A
Vehicles, machinery	Noise	Air/windborne	Mardie Station	Refer to	C = Minor	Y	N/A	N/A

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Risk Event					Risk rating ¹ C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
		pathway	Homestead 250 m from premises	Section 3.1	L = Unlikely Medium Risk			
Rainfall	Contaminated stormwater	Direct discharges	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	Condition 1, Table 1 Design and construction / installation requirements: requires landfill to located 100 m from surface water, stormwater segregation.	N/A
Fires	Dark smoke	Air/windborne pathway	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1, Table 1 Design and construction / installation requirements: requires firebreak. Condition 10, Table 3, restricts waste being burnt at the landfill.	N/A
Windblown	Debris attracting stock and other fauna	Air/windborne pathway	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Slight L = Possible Low Risk	Y	Condition 1, Table 1 Design and construction / installation requirements: requires fence. Condition 10, Table 3 Infrastructure and equipment requirements during time limited operations: requires limited tipping area, covering of waste, windblown waste management.	N/A
Seepage through base of landfill cells	Leachate	Infiltration	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	Condition 1, Table 1 Design and construction / installation requirements: requires base of landfill be more than 3 m from groundwater levels	N/A

Risk Event					Risk rating ¹ C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
Commissioning and Operations (including time-limited-operations operations)								
Category 14								
Increased export quantities to 5.35 Mtpa of salt and 140 ktpa of SoP (average) Changes to the size and location of evaporation and, salt and Kainite-Type-Mixed Salts (KTMS) crystalliser ponds Increase in the number of salt and KTMS crystalliser ponds	Dust	Air/windborne pathway causing impacts to health and amenity	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	Condition 5, Table 2 Environmental commissioning requirements: requires dust management measures to be implemented and moisture content to be maintained. Condition 10, Table 3 Infrastructure and equipment requirements during time limited operations: requires dust management measures to be implemented. Conditions 11 and 12 require a time limited operations report.	N/A
Lighting structures on infrastructure	Light	Emitted from lighting structures	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1, Table 1 Design and construction / installation requirements: requires targeted lighting and red or low-pressure sodium lights.	N/A
Increased throughput and inclusion of additional salt and KTMS crystalliser ponds	Noise	Air/windborne pathway causing impacts to health and amenity	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Conditions 11 and 12 require a time limited operations report.	N/A
Changes to pond wall design	Brine	Unintentional discharge through	Surrounding vegetation,	Refer to	N/A	N/A	N/A	Regulated via Ministerial

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Risk Event					Risk rating ¹ C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
		spills/leaks from overtopping or pipeline ruptures	surface water and groundwater	Section 3.1				Statement 1211.
Increased throughput primary seawater intake, inclusion of salt and KTMS crystalliser ponds and brine discharges		Leachate through base and embankments of ponds	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	N/A	N/A	N/A	Regulated via Ministerial Statement 1211.
	Bitterns	Discharge through diffuser at end of trestle jetty of the Mardie Port Facility	Marine environment	Refer to Section 3.1	N/A	N/A	N/A	Regulated via Ministerial Statement 1211.
Areas where stored and transferred	Chemicals and hydrocarbons	Direct discharges due to spills/leaks	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	N/A	N/A
SOP and salt stockpiles due to increased export quantities	Contaminated stormwater with salt	Stormwater runoff	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	N/A	Y	N/A	Regulated via Ministerial Statement 1211.
Category 89								
Vehicles, machinery	Dust	Air/windborne pathway	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	Condition 10, Table 3 Infrastructure and equipment requirements: requires no visible escape from premises.	N/A
Vehicles, machinery	Noise	Air/windborne pathway	Mardie Station Homestead	Refer to Section 3.1	C = Minor L = Unlikely	Y	N/A	N/A

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Risk Event					Risk rating ¹ C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
			250 m from premises		Medium Risk			
Rainfall	Contaminated stormwater	Direct discharges	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	Condition 10, Table 3 Infrastructure and equipment requirements: requires waste not to be washed offsite and returned to site.	N/A
Use of fuels, contaminated wastes	Chemicals and hydrocarbons	Direct discharges	Surrounding vegetation, surface water and groundwater	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	N/A	N/A
Fires	Dark smoke	Air/windborne pathway	Mardie Station Homestead 250 m from premises	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 10, Table 3 Infrastructure and equipment requirements during time limited operations: requires no waste burning and procedure to be in place.	N/A

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

Note 2: Proposed Works Approval Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

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

Table 5: Consultation

Consultation method	Comments received	Department response
Local Government Authority advised of proposal (13/11/2023)	The City of Karratha replied on 08/12/2023 stating that they have no objections to the proposal.	Noted.
Department of Planning, Lands and Heritage (DPLH) advised of proposal (13/11/2023)	<p>DPLH replied on 06/12/2023 stating that a portion of the area intersects with Aboriginal Heritage Place and Aboriginal Sites. In 2018 the Works Approval Holder undertook a work program clearance heritage survey with the Yaburara and Mardudhunera People Native Title Holders and the survey report noted:</p> <ul style="list-style-type: none"> • Aboriginal Site ID 6322 (MARDIE CREEK BURIAL) and Aboriginal Heritage Place ID 26578 (Wirawundi Pool (Mardie Pool)) are outside of the Mardie Salt Project footprint; • Aboriginal Site ID 17429 (NYUNGARRARRA (PETERS CREEK)) is not considered a site under Section 5 of the <i>Aboriginal Heritage Act 1972</i> (AHA). This place was reassessed in 2021 and is now considered an Aboriginal site under the AHA; and • If the proposed footprint of the project continues to avoid Aboriginal Site ID 6322 (MARDIE CREEK BURIAL) and Aboriginal Heritage Place ID 26578 (Wirawundi Pool (Mardie Pool)) and does not intersect Aboriginal Site ID 17429 (NYUNGARRARRA (PETERS CREEK)), then approval under the AHA will not be required. <p>Any proposed activities within the Aboriginal sites and Heritage Place listed above will require approval under the AHA. Mardie Minerals should ensure compliance under the current AHA and contact Aboriginal heritage conservation to discuss their obligations further.</p>	Works Approval Holder to ensure approvals are obtained under the AHA prior to implementation.

Consultation method	Comments received	Department response
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal (13/11/2023)	N/A	N/A
Department of Jobs, Tourism, Science and Innovation advised of proposal (13/11/2023)	N/A	N/A
CITIC Pacific Mining Management advised of proposal (13/11/2023)	N/A	N/A
Works Approval Holder was provided with draft amendment on (21/02/2024)	Works Approval Holder replied on 14/03/2024. Refer to Appendix 1.	Works Approval Holder replied on 14/03/2024. Refer to Appendix 1.

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Works Approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 6 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Works Approval as part of the amendment process.

Table 6: Summary of works approval amendments

Condition no.	Proposed amendments
Front page	Modifications to Premises details. Addition of Category 89: Putrescible landfill site.
1, Table 1	Modifications to add Pond 0 (Settlement Pond) and additional Evaporation Pond. Addition of Putrescible Landfill.
5, Table 2	Modifications to add Pond 0 (Settlement Pond), Crystalliser Ponds numbers for Salt production and SOP protection). Modifications to commissioning timeframes.
10, Table 3	Increase in seawater input from primary and secondary inputs. Addition of Putrescible landfill.
Schedule 1: Maps	Updated map.

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. Phoenix Environmental Sciences, Flora and vegetation and terrestrial fauna values of the Mardie Project, Trial Pond study area, Prepared for BCI Minerals Ltd, August 2018, Final Report, Balcatta, Western Australia.
5. BCI Minerals, Mardie Project - Works Approval Application Solar Salt Production 1 of 2 15/06/2023, West Perth, Western Australia.
6. BCI Minerals, Mardie Project - Works Approval Application Solar Salt Production 2 of 2 15/06/2023, West Perth, Western Australia.
7. BCI Minerals, Optimised Mardie Project 09/10/2023, West Perth, Western Australia.
8. BCI Minerals, RE: Amendment application - W6594/2021/1 31/10/2024, West Perth, Western Australia.
9. BCI Minerals, RE: Amendment application - W6594/2021/1 07/12/2024, West Perth, Western Australia.
10. BCI Minerals, RE: W6594 Mardie Project Amendment 01/02/2024, West Perth, Western Australia.
11. BCI Minerals, W6594 Mardie Project Amendment 05/02/2024, West Perth, Western Australia.
12. BCI Minerals, RE: W6594 Mardie Project Amendment 08/02/2024, West Perth, Western Australia.
13. BCI Minerals, Ref: DER2021/000356 - W6594/2021/1 Mardie Project - Response to draft conditions 14/03/2024, West Perth, Western Australia.
14. BCI Minerals, RE: Ref: DER2021/000356 - W6594/2021/1 Mardie Project - Response to draft conditions 15/03/2024, West Perth, Western Australia.
15. BCI Minerals, RE: Ref: DER2021/000356 - W6594/2021/1 Mardie Project - Response to draft conditions 05/04/2024, West Perth, Western Australia.
16. BCI Minerals, RE: Ref: DER2021/000356 - W6594/2021/1 Mardie Project - Response to draft conditions 08/04/2024, West Perth, Western Australia.
17. BCI Minerals, RE: Grant of Mining Leases 08/538 and 08/539 to Mardie Minerals Pty Ltd 10/04/2024, West Perth, Western Australia.
18. BCI Minerals, RE: Grant of Mining Leases 08/538 and 08/539 to Mardie Minerals Pty Ltd 24/04/2024, West Perth, Western Australia.
19. BCI Minerals, RE: References 29/04/2024, West Perth, Western Australia.

Appendix 1: Summary of Works Approval Holder's comments on risk assessment and draft conditions

Condition	Summary of Works Approval Holder's comment	Department's response
1, Table 1, Item 1	Evaporation Ponds in the Infrastructure column should be numbered 1 -9. Primary and Secondary Crystallisers should be numbered 1 – 10.	Updated as requested.
1, Table 1, Item 2	<p>Category 73 – Bulk storage of chemicals is not part of this application or the original application. The storage of fuels is and is expected to remain under the Production or design capacity listed in Schedule 1 – Part 2 of the <i>Environmental Protection Regulations 1987</i>.</p> <p>Guidance Statement: Setting Conditions states that Work Approvals may be granted subject to conditions that are “fairly and reasonably related to the activities within the category of prescribed premises the subject of the licence”.</p> <p>The Bulk Fuel Facility and the requirements should be removed from the Works Approval.</p>	<p>This is outside the scope of the current amendment.</p> <p>Please note that DWER's assessment of the Bulk Fuel Facility was issued on 16 February 2022 as part of the originally issued works approval with adequate consultation with the Applicant. It does not form part of the scope of this amendment.</p> <p>As per the Guideline, Risk assessments “DWER will determine likely emissions arising from the primary activities which fall into the category of prescribed premises in Schedule 1 of the <i>Environmental Protection Regulations 1987</i> and may have specific conditions in regulatory instruments (primary activities include directly related activities that cause emissions and discharges).” The Bulk Fuel Facility is a directly related activity to the Category 14 activities.</p> <p>Further, as per the Guidance Statement: Setting conditions, “works approvals and licences may be granted subject to conditions that are ..fairly and reasonably related to the activities within the category of prescribed premises the subject of the licence”.</p>
5, Table 2, Item 4	<p>Categories 52 and 84 – Power generation infrastructure is not part of this application and was not in the original application. The design and capacity of the proposed power station is yet to be finalised. If the capacity of the power station meets the Production or design capacity listed in Schedule 1 – Part 2 of the <i>Environmental Protection Regulations 1987</i> then a works approval application will be submitted.</p> <p><i>Guidance Statement: Setting Conditions</i> states that Work Approvals may</p>	<p>This is outside the scope of the current amendment.</p> <p>Please note that DWER's assessment of the Power Station was issued on 16 February 2022 as part of the originally issued works approval with adequate consultation with the Applicant. It does not form part of the scope of this amendment.</p> <p>As per the Guideline, Risk assessments “DWER will determine</p>

Condition	Summary of Works Approval Holder's comment	Department's response
	<p>be granted subject to conditions that are "fairly and reasonably related to the activities within the category of prescribed premises the subject of the licence".</p> <p>The Power generation infrastructure and the requirements should be removed from the Works Approval.</p>	<p>likely emissions arising from the primary activities which fall into the category of prescribed premises in Schedule 1 of the <i>Environmental Protection Regulations 1987</i> and may have specific conditions in regulatory instruments (primary activities include directly related activities that cause emissions and discharges)." The Bulk Fuel Facility is a directly related activity to the Category 14 activities.</p> <p>Further, as per the Guidance Statement: Setting conditions, "works approvals and licences may be granted subject to conditions that are ..fairly and reasonably related to the activities within the category of prescribed premises the subject of the licence".</p>
10, Table 3, Item 4	As above, Power Station should be removed from the Works Approval.	As above.