Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6594/2021/1
Works approval holder	Mardie Minerals Pty Ltd
ACN	152 574 457
Registered business address	BCI Minerals Limited Level 2, 1 Altona Street WEST PERTH WA 6005
DWER file number	DER2021/000356
Duration	17/02/2022 to 16/02/2027
Date of issue	16/02/2022
Date of amendment	29/04/2024
Premises details	Mardie Project G08/101, G08/93, L08/193, L08/233, M08/525, M08/526, M08/527 and M08/539 MARDIE WA 6714

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**	**Assessed production / design capacity**
Category 14: Solar salt manufacturing	6,800,000 tonnes per annual period of salt 180,000 tonnes per annual period of sulphate of potash (SOP)
Category 89: Putrescible landfill site	2,880 tonnes per annual period

This works approval is granted to the works approval holder, subject to the attached conditions, on 29 April 2024, by:

Jarrod Abrahams
Digitally signed by Jarrod Abrahams
Date: 2024.04.29 16:13:48 +08'00'

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

Works approval history

Date	Reference number	Summary of changes
16/02/2022	W6594/2021/1	Works approval granted.
29/04/2024	W6594/2021/1	• 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 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.

Interpretation

In this works approval:

(a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this works approval:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

Construction phase

Infrastructure and equipment

1. The works approval holder must:

(a) construct and/or install the infrastructure and/or equipment;

(b) in accordance with the corresponding design and construction / installation requirements;

(c) at the corresponding infrastructure location; and

as set out in Table 1.

Table 1: Design and construction / installation requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location
1.	Solar salt manufacturing: • Primary and Secondary Saltwater Intake; • Pond 0 (Settlement Pond); • Evaporation Ponds (1 – 9); • Primary and Secondary Crystallisers (1 – 10); • Tertiary (Kainite-Type-Mixed Salts; KTMS) Crystallisers; • Salt Wash Plant; • SOP Plant; • Salt and SOP Stockyard; • Brine outfall diffuser; • Desalination Plant; and • Pipelines	Dust controls to be implemented during construction: • Areas are not to be disturbed and vegetation is not to be cleared until the areas are required to be used; • Areas disturbed to be minimized where practicable; • Dust suppression techniques to be used on roads and/or cleared areas that pose a dust risk; • Regular visual dust inspections must be conducted to ensure that dust control measures are implemented and effective; • Monitoring of high-risk weather conditions (elevated wind speeds, high fire risk forecasts and heavy rainfall/cyclone events) for dust emissions will be conducted and appropriate actions taken to reduce dust emissions; • The SOP drying area, the SOP compaction plant, and the SOP product storage area are all to be fully enclosed and fitted with dust filtration extraction systems. • The SOP plant to be equipped with a dust extraction system that reports to a baghouse; and • Off-gas from the SOP drying process to be passed through a dust cyclone and baghouse prior to venting to atmosphere, captured	Schedule 1: Maps, Figure 1

	Infrastructure	Design and construction / installation requirements	Infrastructure location
		dust will be reintroduced to the processing circuit. Light controls to be implemented on infrastructure requiring lighting: • All external lighting to be targeted where possible, using shields and directional lighting to minimise light spill beyond the required work area; and • External lighting must use, where possible, red or low pressure sodium lights. Bright white lights such as mercury vapour, metal halide or florescent to be avoided where possible. Overflow management controls to be implemented: • SOP Plant constructed with concrete bunding for areas where chemicals are transferred and stored; • Bunds will include inbuilt sumps with automatic pumps to return spilt material to the process; • Process tanks will be fitted with high-level audible alarms and interlocking to automatically cease filling in the event of overfilling; • Evaporation and Crystalliser Ponds designed with minimum 0.5m freeboard to prevent overflows during 1:100 ARI rainfall event; • Contingency discharge points are in place for if surface run-off upstream of the ponds overflows the flood levee protecting the eastern side of these ponds: ➢ Evaporation Ponds: Rainwater will skim off the top of the Evaporation Ponds and discharge to the marine environment via dedicated spillways located along the length of the main Evaporation Pond sea wall; and ➢ Crystalliser Ponds: Rainwater will skim off the top of the Crystalliser Ponds into adjacent brine	

	Infrastructure	Design and construction / installation requirements	Infrastructure location
		collection channel, from where it will either be pumped or gravity discharged into the Evaporation Ponds. Stockyards will be constructed with compacted basement paving to direct stormwater drainage to: • Contaminated stormwater from within the yards will drain to a HDPE lined stormwater pond; and • Clean stormwater from the yards will be diverted around the yards into an infiltration sump.	
2.	Bulk Fuel Facility	• Equipped with 110 kL self-bunded above ground diesel storage tanks; • Leak detection system and alarms; • Interconnecting pipework and pumps installed at ground level where possible; • Pipe crossings off roads will be double contained with trafficable lids to facilitate spills and leaks detection; and • Local stop start and emergency stop control stations at each unloading connection point.	Schedule 1: Maps, Figure 1
3.	Putrescible landfill	• 70 unlined, earthen cells; • Cells arranged in five banks each with 14 cells; • Landfill site will be fenced, with a minimum requirement being a stock fence; • The fence will be located more than 35 m from the landfill cells; • No surface water bodies within 100 m of the landfill; • The base of the landfill cells will be more than 3 m above the highest groundwater levels at the site; • 4 m table drain will be installed to ensure stormwater and spoil run off is contained; • Stormwater from the operating cells will be contained by the cell excavation itself (the cells will not be	Schedule 1: Maps, Figure 1

	Infrastructure	Design and construction / installation requirements	Infrastructure location
		free draining); and • A 3 m firebreak will be installed.	

Compliance reporting

2. The works approval holder must within 30 calendar days of an item of infrastructure or equipment required by condition 1 being constructed and/or installed:

(a) undertake an audit of their compliance with the requirements of condition 1; and

(b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

3. The Environmental Compliance Report required by condition 2, must include as a minimum the following:

(a) certification by a suitably qualified and experienced Engineer (eligible for membership of the Institute of Engineers, Australia) that the items of infrastructure or component(s) thereof, as specified in condition 1, have been constructed in accordance with the relevant requirements specified in condition 1;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 1; and

(c) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Environmental commissioning phase

Environmental commissioning requirements and emission limits

4. The works approval holder may only commence environmental commissioning of an item of infrastructure listed in condition 1 once the Environmental Compliance Report has been submitted for that item of infrastructure in accordance with condition 2 of this works approval.

5. Any environmental commissioning activities undertaken for an item of infrastructure specified in Table 2 may only be carried out:

(a) in accordance with the corresponding commissioning requirements; and

(b) for the corresponding authorised commissioning duration.

Table 2: Environmental commissioning requirements

	Infrastructure	Commissioning requirements	Authorised commissioning duration
1.	Seawater intakes Pond 0 (Settlement Pond)	Testing of all pumps and confirmation of the ability of the infrastructure to operate at the required capacity	2 months commissioning with continued ongoing use throughout the commissioning and time limited operational periods
2.	Evaporation Ponds 1 - 9	Filling and gradual evaporation until the pond reaches the target brine density or crystallization Dust controls: • The works approval holder must ensure that no visible dust generated from the primary activities crosses the boundary of the premises; and • The works approval holder must manage dust generation at the premises by: ➢ Wetting down unsealed roads and exposed areas with a water truck; ➢ Limiting all vehicle traffic speeds within the premises; and ➢ Ceasing dust-generating activities during strong wind conditions.	32 months
	Crystalliser Ponds 1 – 7 (Salt production)		24 months
	Crystalliser Ponds 8 – 10 (SOP production)		32 months
3.	Process Plants and Stockyards	Testing of all equipment with product to confirm that the infrastructure can operate at the required capacity and achieve the required outputs. Dust controls: Moisture content of <7.5% w/w maintained in processing in SOP Plant. Drying and crushing of SOP to be conducted in fully enclosed metal-clad buildings with dust filtration	17.5 months
	Salt Plant and Stockyard		4.5 months
	SOP Plant		8 months

	Infrastructure	Commissioning requirements	Authorised commissioning duration
4.	Power Station	Noise controls: Only seven out of the nine gas engines may be operational at any time.	6 months

6. The works approval holder must submit to the CEO an Environmental Commissioning Report within 30 calendar days of the completion date of environmental commissioning for each item of infrastructure specified in Table 2.

7. The works approval holder must ensure the Environmental Commissioning Report required by condition 6 of this works approval includes the following:

(a) a summary of the environmental commissioning activities undertaken, including timeframes and amount of seawater processed, products produced and bitterns discharged;

(b) a summary of the environmental performance of each item of infrastructure or equipment as constructed or installed (as applicable), which at minimum includes records detailing the:

(i) commissioning of the infrastructure; and
(ii) testing of the infrastructure;

(c) a review of the works approval holder's performance and compliance against the conditions of this works approval; and

(d) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Time limited operations phase

Commencement and duration

8. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 1:

(a) where the item of infrastructure is not authorised to undertake environmental commissioning, the Environmental Compliance Report as required by condition 2 has been submitted by the works approval holder for that item of infrastructure; and

(b) where the item of infrastructure is authorised to undertake environmental commissioning under condition 5, the Environmental Commissioning Report for that item of infrastructure as required by condition 6 has been submitted by the works approval holder.

9. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 10 (as applicable):

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 8 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 9(a).

10. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 3 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 3.

Table 3: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	**Operational requirement**	**Infrastructure location**
1.	Seawater intakes	180 GL/a seawater input from primary intake during time limited operations phase 16 GL/a seawater input from secondary intake during time limited operations phase	Schedule 1: Maps, Figure 1
2.	Evaporation and Crystalliser Ponds	Noise controls: Secondary Crystalliser Ponds must only be harvested by chemically redissolving the crystallised salt with fresh seawater, as opposed to tractor harvesting. Harvesting of the KTMS Crystalliser Ponds must only occur between day time hours 7:00am – 7:00pm.	Schedule 1: Maps, Figure 1
		Dust controls: • The works approval holder must ensure that no visible dust generated from the primary activities crosses the boundary of the premises; and • The works approval holder must manage dust generation at the premises by: ➢ Wetting down unsealed roads and exposed areas with a water truck; ➢ Limiting all vehicle traffic speeds within the premises; and ➢ Ceasing dust-generating activities during strong wind conditions.	Schedule 1: Maps, Figure 1
3.	Process Plants and Stockyards	Dust controls: • Moisture content of <7.5% w/w maintained in processing in SOP Plant.	Schedule 1: Maps, Figure 1
4.	Power Station	Noise controls: • Only seven out of the nine gas	Schedule 1: Maps, Figure 1

	Site infrastructure and equipment	Operational requirement	Infrastructure location
		engines may be operational at any time.	
5.	Putrescible landfill	Putrescible and Inert Waste Type 1 waste types. Tipping area of the landfill will be not greater than: • 30 m in length; and • 2m above ground level in height. Waste in the tipping area of the landfill to 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. Landfill managed to ensure that: • Waste does not get washed, or blown, outside the landfill area; and • Waste that has been washed, or blown, away from the tipping area of the landfill is returned to the tipping area at least once in each month. No visible dust escapes from the landfill. No waste is burnt at the landfill. Appropriate procedures in force onsite to ensure that: • Any unauthorised fire on site is promptly extinguished; • Appropriate alarm and evacuation procedures are in place; • Report provided within 14 days of a fire including: ➢ 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; ➢ the cause, or suspected cause, of the fire. Clinical waste or material containing asbestos is not to be disposed of at	Schedule 1: Maps, Figure 1

	Site infrastructure and equipment	Operational requirement	Infrastructure location
		the Landfill Facility.	

Compliance reporting

11. The works approval holder must submit to the CEO a report on the time limited operations within 30 calendar days of the completion date of time limited operations or 30 calendar days before the expiration date of the works approval, whichever is the sooner.

12. The works approval holder must ensure the report required by condition 11 includes the following:

(a) a summary of the time limited operations, including timeframes and amount of seawater processed, products produced and bitterns discharged;

(b) a summary of the environmental performance of all infrastructure as constructed or installed (as applicable), which includes records detailing the:

(i) seawater processed;
(ii) products produced; and
(iii) bitterns discharged;

(c) a review of performance and compliance against the conditions of the works approval and the Environmental Commissioning Report; and

(d) where the manufacturer's design specifications and the conditions of this works approval have not been met, what measures will the works approval holder take to meet them, and what timeframes will be required to implement those measures.

Records and reporting (general)

13. The works approval holder must record the following information in relation to complaints received by the works approval holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the works approval holder to investigate or respond to any complaint.

14. The works approval holder must maintain accurate and auditable books including the following records, information, reports, and data required by this works approval:

(a) the works conducted in accordance with condition 1;

(b) any maintenance of infrastructure that is performed in the course of complying with condition 1; and

(c) complaints received under condition 13.

15. The books specified under condition 14 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the works approval holder for the duration of the works approval; and

(d) be available to be produced to an inspector or the CEO as required.

Definitions

In this works approval, the terms in Table 4 have the meanings defined.

Table 4: Definitions

Term	Definition
annual period	a 12-month period commencing from 01 January until 31 December of that year.
ARI	Annual Recurrence Interval
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
Department	means 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.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
environmental commissioning	means the sequence of activities to be undertaken to test equipment integrity and operation, or to determine the environmental performance, of equipment and infrastructure to establish or test a steady state operation and confirm design specifications.
Environmental Commissioning Report	means a report on any commissioning activities that have taken place and a demonstration that they have concluded, with focus on emissions and discharges, waste containment, and other environmental factors.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been constructed and/or installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).

Term	Definition
HDPE	High density polyethelene
premises	the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
SOP	sulphate of potash
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
waste	has the same meaning given to that term under the EP Act.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).

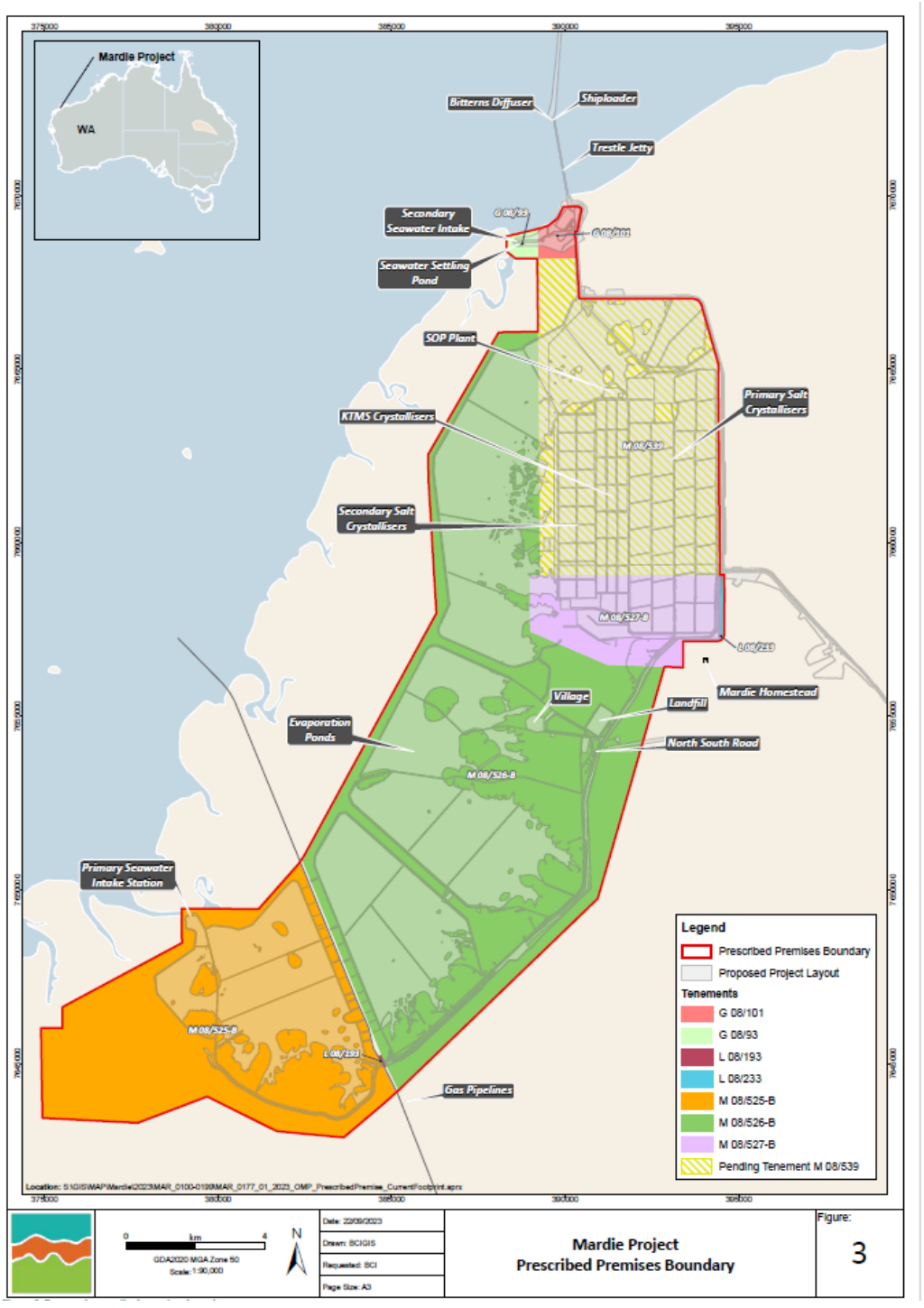

Figure 1: Map of the boundary of the prescribed premises