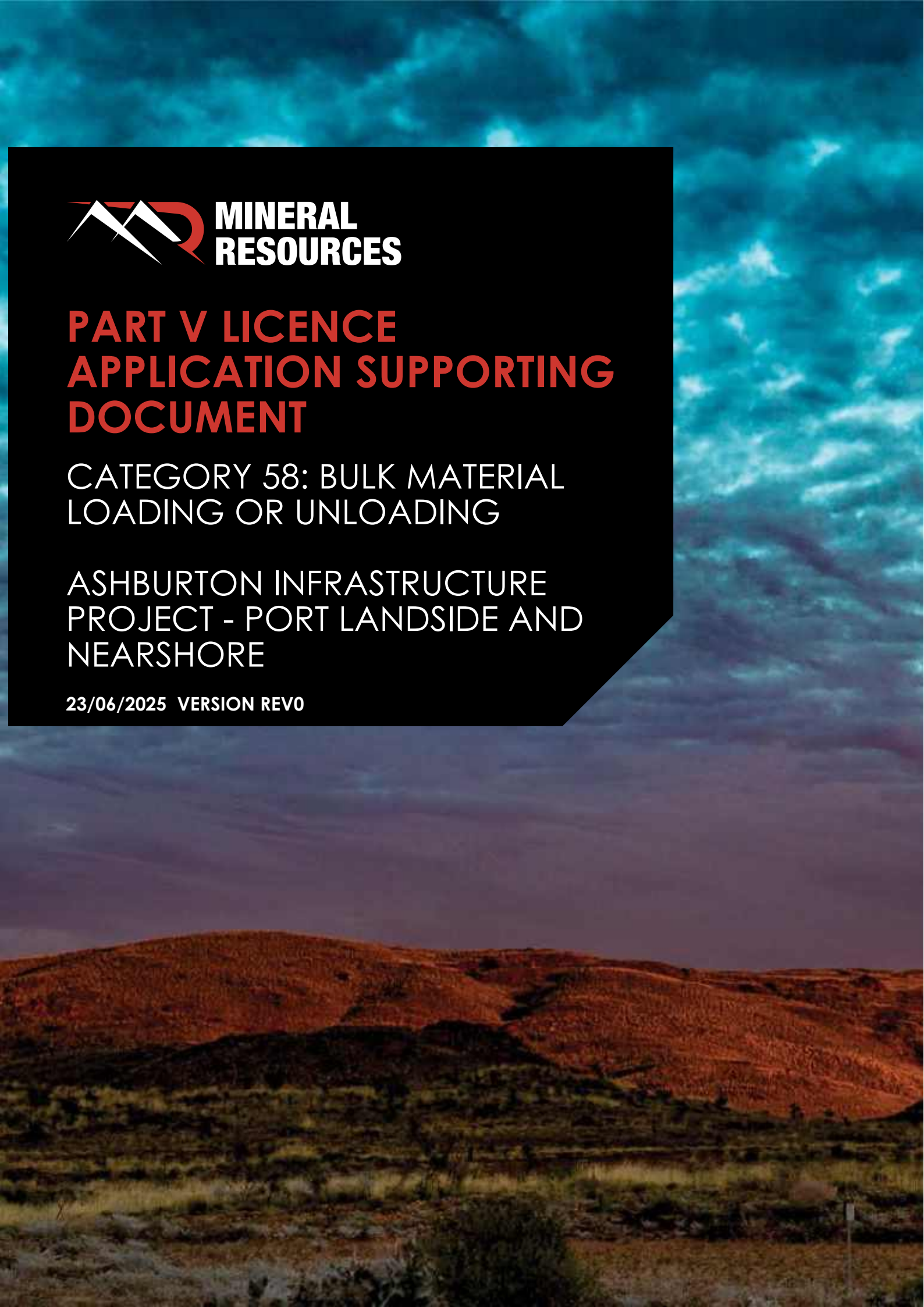

MINERAL RESOURCES

PART V LICENCE APPLICATION SUPPORTING DOCUMENT

CATEGORY 58: BULK MATERIAL LOADING OR UNLOADING

ASHBURTON INFRASTRUCTURE PROJECT - PORT LANDSIDE AND NEARSHORE

23/06/2025 VERSION REV0

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Acknowledgement of Country

MinRes is committed to reconciliation and recognises and respects the significance of Aboriginal and Torres Strait Islander peoples' communities, cultures, and histories. MinRes acknowledges and respects Aboriginal and Torres Strait Islander peoples as the traditional custodians of the land.

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ABBREVIATIONS

Abbreviation	Definition
AGIP	Australia Gas Infrastructure Group
AIP	Ashburton Infrastructure Project
ANSIA	Ashburton North Strategic Industrial Area
ANZG	Australian and New Zealand Guidelines
ARI	Average Recurrence Interval
ATB	Articulated Tug and Barge
BTEX	Benzene, toluene, ethylbenzene and xylenes
CID	Channel Iron Deposits
CME	Chamber of Minerals and Energy
CMF	Cloth Media Filters
DAWE	Department of Agriculture, Water and Environment
dB	decibels
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DE	Development Envelope
DEM	Dust Extinction Moisture
DEMIRS	Department of Energy Mines Industry Regulation and Safety
DevWA	Development WA
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DoHs	Department of Health
DoT	Department of Transport
DSO	Direct Shipping Ore
DWER	Department of Water and Environmental Regulation
EETM	Emission Estimation Technique Manua
EPBC	*Environment Protection and Biodiversity Conservation Act 1999*
EP Act	*Environmental Protection Act 1986*
EP Regulations	*Environmental Protection Regulations 1987*
EPA	Environmental Protection Authority
EPAS	Environmental Protection Authority Services
EQOs	Environmental Quality Objectives

Abbreviation	Definition
ETA	Environmental Technologies and Analytics
EVs	Environmental Values
GAI	Geological Abundance Indices
GHS	Global Harmonised System of Labelling of Chemicals
GL	Gigalitres
ha	hectares
JTSI	Department of Jobs, Tourism, Science, and Innovation
kL	kilolitres
km	kilometres
LEPA	Low Ecological Protection Area
LV	light vehicles
LWMS	Local Water Management Strategy
mAHD	metres Australian Height Datum
MARPOL	Prevention of Pollution from Ships
MinRes	Mineral Resources Limited
MOEMMP	Marine Operations Environmental Management and Monitoring Plan
mm	millimetre
MNES	Matters of National Environmental Significance
MRWA	Main Roads WA
MS	Ministerial Statement
Mtpa	million tonnes per annum
MW	Megawatts
NORM	Naturally Occurring Radioactive Materials
NPI	National Pollutant Inventory
OCCI	Onslow Chamber of Commerce and Industry
OGVs	Ocean Going Vessels
Onslow Infraco	Onslow Infraco Pty Ltd
Onslow Iron	Onslow Iron Pty Ltd
PDWSA	Public drinking water source areas
PER	Public Environment Report
PHIC	Port Hedland Industries Council
PM_{10}	Particulate Matter 10 micrometres
PPA	Pilbara Ports Authority

Abbreviation	Definition
RBC	Rotating Biological Contractors
RIWI Act	*Rights in Water and Irrigation Act 1914*
RSD	Referral Supporting Document
SDS	Safety Data Sheet
SPL	Single Point Loading
t/dat	Tonnes per day
The Port	Port of Ashburton
TLO	Time Limited Operations
TRH	Total Recoverable Hydrocarbons
TSS	Total Suspended Solids
TSVs	transhipment vessels
W6713	Works Approval W6713/2022/1
WAFIC	WA Fishing Industry Council
WPIOP	West Pilbara Iron Ore Project
WRF	Weather Research and Forecasting
WWTP	Wastewater Treatment Plant

1. PROJECT OVERVIEW AND PURPOSE

1.1 OVERVIEW AND BACKGROUND

Onslow Infraco Pty Ltd (**Onslow Infraco**, the **Applicant**), a wholly owned subsidiary of Mineral Resources Limited (**MinRes**) is seeking a Licence from the Department of Water and Environmental Regulation (**DWER**) under Part V of the *Environmental Protection Act 1986* (the **EP Act**), for the operation of the landside and nearshore bulk materials handing facility to support export of iron ore at the Pilbara Ports Authority (**PPA**), Port of Ashburton (**the Port**). The premises relates to category 58 under Schedule 1 of the *Environmental Protection Regulations 1987* (the **EP Regulations**) (**Attachment 2**).

Landside and nearshore bulk materials handling infrastructure detailed in this document and the Licence Application was constructed in accordance with the Ashburton Infrastructure Project (**AIP**) Works Approval W6713/2022/1 (**W6713**). Environmental compliance reports and an Environmental Commissioning Report have been lodged with DWER following the staged construction works, and the premises is currently operating under Time Limited Operations (**TLO**) conditions of W6713.

The landside and nearshore facility form part of the larger AIP, that includes a fully sealed private haul road, commencing at the boundary of the approved Buckland Project haul road (Ministerial Statement [**MS**] 960 and MS 1147), and continuing approximately 125 kilometres (**km**) west to link to Onslow Road. The AIP was referred to the Environmental Protection Authority (**EPA**) for assessment under Part IV of the EP Act on 26 October 2021 (Assessment Number 2320), with the resultant MS 1204 issued 3 July 2023 (**Attachment 5**).

The components of the AIP that are relevant to the Licence Application include:

- Landside Facility (port): where crushed ore from the West Pilbara operation will be unloaded from haul trucks, stockpiled and loaded onto a conveyor system (bulk handling facility).
- Nearshore Facility (marine): where the conveyed ore is loaded onto berth transhipment vessels (**TSVs**) for offshore transfer to ocean going vessels (**OGVs**) at offshore anchorage points.

1.2 PURPOSE OF THE DOCUMENT

The Applicant submits a Licence Application to DWER pursuant to Part V of the EP Act, to operate the landside and nearshore materials handling infrastructure to facilitate loading of up to 40 million tonnes per annum (**Mtpa**) of iron ore onto **TSVs**. This Supporting Document has been prepared to support the Licence Application.

The Licence Application and this Supporting Document demonstrates that the predicted impacts from potential emissions associated with material handling activities at the premises can be appropriately managed to reduce adverse impacts to sensitive receptors.

1.3 PRESCRIBED PREMISES CATEGORY

The prescribed premises category relevant to this Licence Application is detailed in **Table 1**.

Table 1: Prescribed Premises Description

Category	Activity / Category	Production or Design Capacity (as per Schedule 1 of EP Regulations)	Actual Production / Storage for this Licence Application
58	Bulk material loading or unloading: premises on which clinker coal, ore, ore concentrate or any other bulk granular material (other than slat) is loaded onto or unloaded from vessels by an open materials loading system	100 tonnes or more per day	Operational throughout capacity up to 110,000 tonnes per day (**t/day**). Up to 40 Mtpa

1.4 EXCLUSIONS

The transfer of iron ore from TSVs to OGVs at the designated offshore anchorage areas are subject to conditions of Licence L9412/2023/1.

The seawater desalination plant (brine discharge no more than 2 gigalitres (**GL**)/ annum)), gas fired power station (14 megawatts (**MW**)), wastewater treatment plant (**WWTP**) (9 m^3/day) and diesel storage facilities (~606 kilolitres (**kL** or 606 m^3) in aggregate) are not sufficient scale to require licensing and approval under Part V of the EP Act, however these facilities and their discharges and wastes are described where relevant to this application.

The discharge of hypersaline brine from the seawater desalination plant to the marine environment is approved via MS 1204 and is managed in accordance with Condition B2-1 and B2-2 and the Marine Operations Environmental Management and Monitoring Plan (**MOEMMP**) (**Attachment 8**).

2. PROJECT APPROVALS BACKGROUND

The AIP, which includes the landside and nearshore materials handling facility, was referred to the EPA for assessment under Part IV of the EP Act on 26 October 2021. The AIP was also referred to the Department of Agriculture, Water and Environment (**DAWE**), now known as Department of Climate Change, Energy, the Environment and Water (**DCCEEW**)) for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**). Further detail of the relevant approvals that relate to this Licence Application are included in the following sections.

Copies of all relevant approvals are provided as **Attachment 5**.

2.1 REFERRAL UNDER S.38 OF THE *ENVIRONMENTAL PROTECTION ACT 1986*, MINISTERIAL STATEMENT

The AIP was referred under Part IV of the EP Act as the development had the potential to significantly impact up to eight of EPA's Environmental Factors (Flora and Vegetation, Terrestrial Fauna, Inland Waters, Marine Fauna, Benthic Communities and Habitat, Marine Environmental Quality, Social Surrounds and Greenhouse Gas Emissions). The Applicant addressed requests for additional information from Governmental agencies and submitted a final version of the Referral Supporting Document (**RSD**) for assessment. The RSD included information relating to the landside and nearshore components of the AIP, which is recognised as the Landside Development Envelope (**DE**) and Nearshore DE. The applicant considered the application of mitigation hierarchy for the development and assessment of the AIP and developed measures to minimise impacts to environmental values for marine environment quality.

On 9 February 2023 the EPA finalised its report, report number 1733 of the EPA, under s. 44 of the EP Act. It describes the outcomes of the EPA's assessment of the AIP and its decision making to recommend to the Minister that the proposal may be implemented, subject to conditions. Subsequently, MS 1204 was granted for the AIP on 3 July 2023.

2.2 REFERRAL UNDER THE *ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999*

The AIP was referred to the former DAWE that is now the DCCEEW for assessment under the EPBC Act. The DCCEEW considered the AIP to be a controlled action as it has the potential to impact on listed threatened species and communities (s. 18 & 18a) and migratory species (s. 20 & 20A) under the EPBC Act (EPBC Ref: 2021/9064). The Applicant prepared and submitted a Public Environment Report (**PER**), supporting technical studies and environmental management plans, in accordance with DAWE determination on 16 February 2022. In accordance with s. 98 (1)(c) of the EPBC Act, the draft PER was made available for public comment for a period of 20 business days from 10 August 2022 to 6 September 2022. The Applicant welcomed public comments on the draft PER and provided a summary of those comments along with a revised version of the PER under s. 99(4) of the EPBC Act. The PER was finalised for assessment by DCCEEW. In accordance with s. 99(4) of the EPBC Act, the final PER was made available for viewing for 20 business days from 9 November 2022. The approval decision was granted by DCCEEW on 12 December 2022 (**Attachment 5**).

2.3 WORKS APPROVAL, *ENVIRONMENTAL PROTECTION ACT 1986*

Construction of the landside and nearshore facilities that include materials handling infrastructure, product storage sheds, ship loading conveyors for loading the TSVs and other auxiliary infrastructure to support the export of iron ore, was subject to conditions of Works Approval W6713/2022/1, granted by DWER on 11 July 2023.

2.4 SUMMARY OF RELEVANT LEGISLATION AND OTHER APPROVALS

Other key approvals relevant to this application and key legislation are summarised in **Table 2**.

Table 2: Summary of Relevant Legislation and Other Approvals

Approvals / Relevant Regulating Department	Legislation	Relevance
Ministerial Statement MS 1204, EPA	*Environmental Protection Act 1986*	MS 1204 authorises disturbance of four spatially separate development envelope areas being the Haul Road Development Envelope (16,209 hectares (**ha**), Landside Development Envelope (118 ha), Nearshore Development Envelope (11 ha) and Offshore Development Envelope (4,483 ha). The operation of the bulk materials facility occurs within the landside and nearshore development envelope. MS 1204 includes conditions to minimise impacts on the marine environment and fauna from vessel loading and from hypersaline brine discharge from the desalination plant.
Ministerial Statement MS 1131, EPA	*Environmental Protection Act 1986*	The Port of Ashburton was initially developed by Chevron Australia for the Wheatstone Project. In 2020, the EPA approved the change of proponent for components of the Wheatstone Project, including the shipping channel, marine offloading facility and a section of the access road, from Chevron Australia to the PPA under Ministerial statement 1131. PPA is the nominated proponent responsible for administering MS 1131. MS 1131 was not originally intended to operate a significant iron ore handling facility. On 2 February 2022 the EPA approved a request change to a proposal for MS 1131 under section 45C of the EP Act to add the Eastern Port Precinct (43.44 ha disturbance area) to MS 1131 to authorise preliminary site preparation works, including development of a temporary construction camp, clearing and earthworks associated with construction of an outer revetment rock wall at the Port.
EPBC Referral 2021/9064, DECEEW	*Environmental Protection and Biodiversity Conservation Act 1999*	The AIP (EPBC 2021/9064) was referred to DAWE under the EPBC Act and on 16 November 2021 was deemed a Controlled Action with the potential to impact on listed threatened species and communities (s. 18 & 18a) and migratory species (s. 20 & 20A). Approval decision granted on 12 December 2022.
5C Groundwater Abstraction Licence, DWER	*Rights in Water and Irrigation Act 1914* (**RIWI Act**)	The production bore on the premises is Licensed under the RIWI Act. It is proposed that water abstracted from the production bore will be used through the desalination plant as required for operations.
Port of Ashburton	• *Port Authorities Act 1999 (WA)* • *Port Legislation Amendment Act 2014* • *Port Authorities Regulations 2001* • The International Convention for the	All vessel movements will be operated in accordance with relevant Port of Ashburton requirements as stipulated by PPA. All vessel movements are subject to Port Authority Act and Regulations, and Harbour Master direction (if any). The Port is managed and operated by the PPA, through the *Port Authorities Act 1999*.

Approvals / Relevant Regulating Department	Legislation	Relevance
	Prevention of Pollution from Ships (**MARPOL**) (Annex V) • *Environmental Protection (Unauthorised Discharges) Regulations 2004*	The *Port Authorities Act 1999* (WA) governs Western Australia's port authorities, covering their functions, responsibilities, concept of operations and related matters. Prior to the passage of the Act, each port authority was established under its own individual legislation. This Act modernised and consolidated governance of all the ports under a single piece of legislation, providing the port authorities with greater autonomy while ensuring that Government retains suitable strategic controls and Ministerial directional powers (Department of Transport (**DoT**), 2023).
Australian Maritime Safety Authority (AMSA)	*Various Marine Orders:* • *Marine Order 91 (Marine pollution prevention—oil) 2014* • *Marine Order 93 (Marine pollution prevention—noxious liquid substances) 2014* • *Marine Order 94 (Marine pollution prevention—packaged harmful substances) 2014* • *Marine Order 95 (Marine pollution prevention—garbage) 2013* • *Marine Order 96 (Marine pollution prevention—sewage) 2013* • *Marine Order 97 (Marine pollution prevention—air pollution) 2013.*	Gives effect to MARPOL – for pollution prevention.
Dangerous Goods Site Licence DGS023087, Department of Energy Mines Industry Regulation and Safety (**DEMIRS**)	*Dangerous Goods Safety Act 2004*	The 3x 200 kL diesel storage tanks are licensed via DGS023087 as well as 5.92 kL of diesel storage located within the materials handling circuit.

3. APPLICANT INFORMATION

3.1 APPLICANT AND OCCUPIER DETAILS

The Applicant and Occupier for the Licence is Onslow InfraCo Pty Ltd (ACN 612 668 201) (**Onslow InfraCo**), a wholly owned subsidiary of Mineral Resources Limited (ACN 118 549 910) (**MinRes**).

The authorised occupier of the Prescribed Premises detailed within the Part V Licence Application is Onslow InfraCo Pty Ltd, as subsidiary of Mineral Resources Ltd. Onslow Infraco have entered into a Lease and Licence with the PPA for the operation and maintenance of the landside and nearshore facility on Lot 569 on Deposited Plan 71345 and Lot 570 on Deposited Plan 71356. Additionally, the facility is also operated in accordance with a PPA Port Facilities Agreement.

The PPA Licence, Lease and Port Facilities Agreement is proof of the occupier status for the premises. This allows Onslow Infraco, as a Proponent, to carry out activities to facilitate the export of product from the Port, and outlines conditions upon which the facility will be operated (**Attachment 1A**).

The PPA Licence and Lease and Port Facilities Agreement includes the operation of activities detailed within the Part V Licence Application, including: truck unloading, in-loading and out-loading conveyor systems, storage shed, and non-process infrastructure; and TSV loading wharf.

Written consent provided by PPA for the Applicant to hold a DWER Part V Licence to occupy and operate the Landside and Nearshore facility at the Port of Ashburton is provided as **Attachment 1A**.

A current ASIC company extract for Onslow Infraco Pty Ltd is provided as **Attachment 1B**.

3.2 LOCATION CONTEXT

The Premises and proposed activities are located approximately 11 km to the southwest of the town of Onslow, within the Shire of Ashburton, in the Pilbara region of WA. The Bulk Handling Facility is located within the Port which is a multi-user port and strategic industrial area. The following developments are located in proximity to the proposed facilities:

- Township of Onslow includes residences, schools and recreation areas approximately 11 km northeast.
- BHP Macedon Gas located approximately 6 km to the southwest.
- Chevron Wheatstone located immediately to the west (1.5 km).
- Onslow Salt – evaporation ponds (3 km to the southeast) and stockpiles and export facilities (10 km to the northeast).

3.3 LEGAL LAND DESCRIPTION

The proposed Prescribed Premises Boundary is largely within the PPA Lease and Licence Area, except are area within the Port Waters where an extension around the wharf and TSV berth has been factored in. This is for the Nearshore facilities (ship loader and TSV) that form part of the materials handling infrastructure and movement of iron ore. The proposed activities and proposed prescribed premises boundary within the Landside portion (bulk loading and unloading facility, materials handling: ore storage sheds and bulk handling facilities) are situated on an area of land at the Port under the control and management of the PPA under the *WA Port Authorities Act 1999*.

Land parcels underlying the proposed prescribed premises boundary are identified as part Lot 569 on Deposited Plan 71345 and part Lot 570 on Deposited Plan 71345 (Reserve 51074).

The Prescribed Premises Map showing the underlying PPA Lease and cadastral land parcels is included as **Attachment 2**.

4. ACTIVITIES

4.1 CATEGORY 58 – SIZE, SCOPE AND SCALE

The Bulk Handling Facility at the Port will facilitate the export of iron ore as a Direct Shipping Ore (**DSO**). The facility is capable of handling up to 40 Mtpa of iron ore (up to 110,000 t/day), transported to the Port by road train from several different satellite mining operations in the West Pilbara.

The facility includes fully enclosed product storage, with a storage capacity of up to 300,000 tonnes of ore product. The storage shed includes a bridge bucket reclaimer and a dust extraction system.

The bulk material loading has an operational loading capacity of up to 110,000 t/day.

Transport of iron ore product via TSVs and powered by tugboats will be on a 24-hours, seven days a week basis to anchorage points to be loaded onto OGVs. The transfer of ore from TSV to OGV is not included in this application, as the offshore anchorage points and associated activities are included in DWER Licence L9412/2023/1.

4.2 OPERATING PROCESS DESCRIPTION AND KEY INFRASTRUCTURE

The following key components make up the Bulk Handling Facility and were constructed in accordance with W6713.

Road Train and Unloading Facility

Road trains enter the product handling and storage facility. This facility includes a truck unloading loop and covered product storage shed. The truck unloading shed includes a single materially enclosed steel structure with multiple lanes in a drive-in/drive-out unloading arrangement. Multiple tipping stations enable trucks to side tip ore product into a fully automated materials handling system.

A series of feeders and conveyors (in-loading conveyor CV01) transfer material into a large storage facility capable of holding up to 300,000 tonnes of ore prior to shipping.

Materials Handling: Ore Storage Sheds and Bulk Handling Facilities

The covered In-loading conveyor from the Road Train Unloading Facility transfers product onto a stockpile tripper conveyor within the enclosed storage shed. The tripper conveyor extends the full length of the storage shed, discharging ore from the tripper cart across the length of the stockpile.

Ore product is reclaimed from the stockpile using a bucketwheel reclaimer (RC01) which is bridge mounted and spans the entire stockpile width. Ore product reclaimed by the reclaimer discharges from the bucketwheel onto a tripper conveyor (CV02) and reclaim conveyor which transfers material onto an out-loading conveyor (CV03). The out-loading conveyor extends the full length of the shed, transferring product to the TSVs via wharf conveyors across the jetty facility (CV04). All external conveyors include top covers and carry side covers, and transfer points are enclosed.

Ship Loader Conveyor to Load TSVs

A wharf and ship loader are used to load the TSVs. The ship loader is positioned on a jetty, and is a modular fixed-point loading wharf, with roadway access and lifting areas accessible for cranes. TSVs are loaded via covered conveyor(s) carrying ore originating from the product storage shed. Product ore will be fed into the TSVs top hatches and distributed via shuttle reversible conveyor within the TSV hopper to ensure even loading.

TSVs

Each TSV incorporates two vessels, an articulated tug and barge (**ATB**) arrangement. The ATBs arrangement consists of a tank vessel (barge) and a large, powerful tug vessel that is positioned in a notch in the stern of the barge, with an articulated or "hinged" connection system between the tug and barge, which enables the tug to propel the barge. Each TSV barge deck has an enclosed cargo hold with loading via the single point loading (**SPL**) hopper. Each TSV barge cargo hold has a maximum hold capacity of 20,000 tonnes (based on cargo with minimum specific gravity of 1.80). TSVs have been designed to minimise product loss and minimise dust emissions through completely enclosed cargo holds, and fitting the loading equipment with water sprays and dust extractors.

The main specifications of the TSV barge are as follows:

- Overall TSV barge length – 123.8 metres (overall length of ATB is 160 m).
- Breadth moulded (TSV barge) – 36.5 metres.
- Design draft (TSV barge) – 7.0 metres.

Product ore is fed into the TSV top hatches and distributed via a shuttle reversible conveyor situated within the enclosed hopper/cargo hold and is used to distribute ore evenly within the cargo hold.

TSVs travel along the existing PPA shipping channel, out to deep water, to dedicated anchorage points. Ore is loaded from TSVs onto OGVs in accordance with conditions of DWER Licence L9412/2023/1.

The layout of the bulk handling facility is shown in **Attachment 2,** and a list of key infrastructure and components is summarised in **Table 3**.

A process flow diagram for the movement of iron ore product through the facility is provided as **Attachment 3B** and is described as follows:

- Road trains enter the premises and proceed to a multi-lane tipping station, being an enclosed shed in which ore is side-tipped from the trucks into receiving hoppers.
- Ore from the hoppers will feed onto a large, covered in-load conveyor, where it is conveyed to the ore storage shed (300,000 tonne capacity) for stockpiling and blending.
- A reclaimer operates within the storage shed and from there will transfer ore onto the out-load conveyor. On occasion, DSO may be conveyed directly to the out-load conveyor, bypassing the product storage shed.
- Ore on the out-load conveyor will be periodically tested to ensure grade control by redirecting samples to the product sample station.
- Ore is then transferred to the wharf conveyor via a transfer/feed chute, which feeds the swing-arm ship loader. The ship loader (also referred to as the TSV loader) carefully directs the ore into the hold of the TSV to ensure even loading.
- TSVs include an SPL system.

Table 3: Key Infrastructure

Key Materials Handling Infrastructure and Equipment		Operational Requirements to minimise / manage emissions
Category 58 Infrastructure		
Truck unloading shed / tipping station	• Semi enclosed multi lane tipping station • Receiving hoppers (HOP01 – HOP04) • Feeders (FE01 – FE05) • Sump pumps (SP01 – SP04) • CV01 in-loading conveyor • In-loading substation • Drive in sumps • Dust spray system on the feeder head chute	• Ore sampled for moisture prior to haulage to the premises, to ensure moisture content of product is at or above Dust Extinction Moisture (**DEM**) levels (range between 5-7%). • Ore at the premises to be maintained at or above DEM levels. DEM results are provided to PPA as part of ongoing operations. • Ore in-loading into hoppers to occur in semi enclosed tipping station. • CV01 conveyor operated with top cover and carry/windward side covers. • Dust suppression system to be used within the truck unloading shed/tipping station. • Dust spray system on the feeder head chute to be used during operations. • Equipment within semi-enclosed tipping station regularly hosed down to minimise dust emissions. • Sumps to be maintained regularly to ensure sufficient capacity by removing excess wet product. Excess wet product sludge will be temporarily stockpiled in a dedicated area that includes a windrowed concrete or compacted earthen pad, for drying prior to removal offsite or being returned to the materials handling circuit. • Temporary sludge stockpiles will be maintained at or above DEM in accordance with PPA requirements, and will be maintained at a height of no greater than 2 metres
Ore storage and reclaim shed	• Fully enclosed storage shed with a 300,000 tonnes capacity for stockpiling and blending • Tripper conveyor (CV02) • Reclaim conveyor • Bidirectional travelling bucket wheel reclaimer (RC01) • Dust collector system (DC01 and DC02) • Storage and reclaim substation • Drive-in sump	• All building openings that are not required for ventilation purposes will be airtight sealed, where practicable. • Roller doors will be electronically actuated. • Ore storage and reclaim shed will be maintained with negative internal pressure. • Dust collectors and fans to be operated, ensuring during maintenance a minimum of one fan will remain online. • Dust collector system will be maintained in good working order. • Mobile track mounted feeder unit a feed hopper may be used in the storage shed during maintenance activities. • Dust suppression sprays to be used at transfer stations. • Sumps to be maintained regularly to ensure sufficient capacity by removing excess product sludge as required for efficient operation.

Key Materials Handling Infrastructure and Equipment		Operational Requirements to minimise / manage emissions
Out loading facility	• Out-load conveyor (CV03) • Thru load feeder • CV03 tower • CV head pully • CV03/CV4 transfer station • CV04 drive pully • Conveyor drives • CV04 wharf conveyor uptake • Substation • Sample conveyor (CV05) • Rejects conveyor (CV06) • Product sample station and sample cutter • Wharf conveyor sump	• Carry side/windward side covers and belt conveyor cover to be used during operation. • Transfer points enclosed. • Sumps to be maintained regularly to ensure sufficient capacity by removing excess product. • An automated sample station will collect ore from the out-load circuit to the TSV for moisture testing to ensure moisture content of product is at or above DEM levels.
Wharf conveyor and ship loader	• Swing arm ship loader • CV04 wharf conveyor • CV04 head chute • SHL01 TSV loader • Boom slew • Wharf substation	• CV04 conveyor to be operated with top covers and carry side/windward side covers. • TSV loader boom conveyor to be operated with top cover and carry side/windward side covers. • Dust suppression water sprays to be used as required on TSV loader boom. • Washdown water containing excessive product residue from maintenance activities will be contained and not discharged into the marine environment. • Sumps to be maintained regularly to ensure sufficient capacity by removing excess product.
Transhipment Vessels	• Transhipment vessels (1 tug per TSV barge – ATB arrangement) • SPL hopper • SPL shuttle reversible conveyor • Top hatch on TSVs • Enclosed cargo hold • Self-unloading system	• Loading hopper is fitted with dust collectors/extractors and misting sprays. • Shuttle reversible conveyor situated within the enclosed hopper/cargo hold. • Enclosed cargo hold/hopper.
Monitoring Infrastructure		

Key Materials Handling Infrastructure and Equipment		Operational Requirements to minimise / manage emissions
Air Quality Monitoring Network	• Light scattering E-sampler nephelometer monitoring units (minimum 1 unit onsite and 2 units at offsite sensitive receptor locations).	• Real time monitoring for Particulate Matter (**PM_{10}**) equivalent to reference methods in AS/NZS 3580.9.17:2018. • Solar powered units or a high-capacity battery system to provide continuous power. • Maintained, serviced and calibrated in accordance with manufacturers specifications. • Monitoring alarms will be activated when dust trigger exceedances occur, and exceedance will be investigated.

4.3 INPUTS

4.3.1 Iron Ore

The input material for operations is up to 40 Mt iron ore per year. The iron ore will be maintained at the relevant DEM level. The moisture of crushed ore is tested at the Onslow Iron Pty Ltd (**Onslow Iron**) West Pilbara Iron Ore Project (**WPIOP**) prior to haulage to the Port premises to ensure the moisture of the product is at or above the DEM. An automated sample station at landside facility also collects ore from the out-load circuit to the TSV for moisture testing.

Conveyor mechanical design criteria for the materials handling facility is based on the following product specifications for generic haematite iron ore data, which is suitable for use across MinRes operating sites within WA:

- Angle of repose - 35 degrees.
- Angle of surcharge fines - 10 degrees.
- Primary crushed Particle size (P_{98}) – 150 mm.
- Lump product particle size (P_{100}) – 50 mm.
- Fines product particle size (P_{100}) – 10 mm.

The mineralogy from one of the deposits where ore will be delivered from at the WPIOP, the Kens Bore deposit, provides an estimate of the material characterisation of iron ore product to be shipped. The mineralogy is typical of Channel Iron Deposits (**CIDs**), composed mostly of goethite hematite, and kaolinite and other clay minerals (illite/mica and minor smectite), and trace amounts of calcite was detected (<1%) (Okane Consultants 2022). The mineralogy of the Upper Cane and Cardo Bore East deposits at the WPIOP is similar to Kens Bore Deposit, being CID and ore mostly comprised of hematite goethite CID.

Total metals results from samples form Kens Bore deposit were used to determine Geological Abundance Indices (**GAI**) for each element, which compares the element concentration to the average crustal abundance for that element. Most of the rock units were enriched in iron (Fe), as well as arsenic (As), antimony (Sb), selenium (Se) and tellurium (Te). These elements were not mobilised under neutral static leach tests (Okane Consultants 2022). Additionally, from the samples analysed, lab results did not indicate any enrichment from Naturally occurring radioactive materials (**NORM**) thorium and uranium (Th and U). The samples analysed from the Upper Cane deposit and the Cardo Bore East Deposit, lab results did not indicate any enrichment from **NORM** (Landloch 2023 and Landloch 2024).

Mineral composition of the iron ore product and trace metal concentrations as detailed on the Safety Data Sheet (**SDS**) is shown in **Table 4** and **Table 5**. The SDS is included as **Attachment 8**. The Iron Ore Fines are classified as non-hazardous according to the Global Harmonised System of Labelling of Chemicals (**GHS**). The SDS indicates the Iron Ore fines are not toxic and no environmental hazards are listed on the SDS under Section 14 – Transport Information.

Table 4: Expected Mineral Composition of Product (Kens Bore Iron Ore Fines)

Mineral Phase	Concentration (w/w%)
Goethite	40 - 50
Hematite	40 - 50
Quartz	10 - 20
(Trace) Respirable crystalline silica	0.03
Kaolinite	5 - 10

Table 5: Trace heavy metals in Product (Kens Bore Iron Ore Fines)

Metal	Concentration (ppm)
Manganese	200 - 500
Zirconium	100 - 200
Barium, vanadium, cooper, tin, arsenic, chromium, strontium, tungsten, nickel, zinc, lead	25 - 100
Rubidium, thorium, uranium	<5

4.4 OTHER ACTIVITIES– NOT PRESCRIBED

The following ancillary infrastructure and services is required to support material handling operations. A summary of the key infrastructure components of each is provided in **Table 6**.

4.4.1 Water Supply – Desalination Plant

Water supply is required for the product handling and storage facility for potable water, dust suppression, and firefighting. Water is sourced from the seawater desalination plant. The plant is designed for permeate requirements of 1,310 m^3/day. Seawater intake of approximately 2,911 m^3/day (~1.06 GL per year) with a recovery of ~45%. (~0.48 GL/annum), based on operating 22 hours per day. Brine discharge rate based off the current design and permeate requirements is approximately 1,601 m^3/day (~0.58 GL/annum). Brine discharge will not exceed 2 GL/annum, in accordance with MS1204.

The desalination plant is a containerised treatment plant with external tanks. The raw seawater is treated to the appropriate specification for potable water requirements and dust suppression requirements and the brine is returned to the ocean. Permanent seawater intake and brine outlet pipelines for the seawater desalination plant are situated within the jetty conveyor corridor, within a low level of ecological protection (**LEP**) area, as defined in MS1204. Saline water may also be sourced from bores located within the Prescribed Premises Boundary that draw from the seawater resource in line with relevant RIWI Act 5C Groundwater licensing requirements.

The production capacity for the seawater desalination plant, does not trigger the threshold for the EP Regulations Schedule 1 Prescribed Premises Category 54A for water desalination, where wastewater is discharged into marine waters and therefore is not required to be licensed under Part V of the EP Act or included as a prescribed activity within this Licence Application.

The discharge of brine to the marine environment has been approved via Ministerial Statement MS 1204, based on model predictions for two discharge rate scenarios: 0.28 GL/a (9 L/s) and 2 GL/a

(65 L/s) with outfall salinity of 70 Practical Salinity Units (PSU), and a temperature increase of one degree above ambient sea temperature. Monitoring and management of brine wastewater discharge is detailed in the MOEMMP (Rev 8) (**Attachment 5**) and is managed in accordance with MS 1204 Condition B2-1 and B2-2 and the MOEMMP.

4.4.2 Power Supply for Bulk Materials Handling

Power supply for the material handling facility is provided by the 14 MW (peak load) gas fired power station. The gas fired power station consists of 9 x 1.56 MW generators. The power station connects to the Australia Gas Infrastructure Group (**AGIP**) gas lateral that connects near the Prescribe Premises Boundary, at the Consumer gas pipeline.

A peak power requirement of 4 – 5 MW is expected for project operations. The power station is operated in accordance with manufacture specifications.

4.4.3 Wastewater Treatment Plant

A 9 m^3/day wastewater treatment plant (WWTP) is used to treat wastewater (greywater and sewage) generated within the premises from administration buildings and site ablutions. The WWTP is a typical package treatment plant with a biological treatment design using Rotating Biological Contractors (**RBC**) and Cloth Media Filters (**CMF**). The WWTP is connected to the seawater desalination plant.

Chemical inputs for the treatment process may include the following, which provide a number of functions within the treatment process:

- Coagulant dosing.
- Sodium hypochlorite dosing.
- Sucrose dosing or equivalent.

The WWTP does not exceed the threshold for the EP Regulations Schedule 1 (Part 1) Prescribed Premises Category 54 or Schedule 1 (Part 2) Category 85 for sewage facilities requiring to be licensed or registered.

Treated effluent will be diluted with potable water as required for use as irrigation water for landscaped gardens onsite (once planted). If not required for irrigation, any unutilised treated effluent is co-disposed with the brine at the brine outfall point.

The WWTP treats wastewater in accordance with the Department of Health (**DoH**) Guidelines for the Non-potable Uses of Recycled Water in Western Australia (DoH 2024). The target concentrations for parameters for the treated effluent will meet DoH requirements with the relevant risk category for human contact and some restricted access. Access to areas under reticulation is restricted to the general public, however will not be restricted to site personnel. Substrata dripper lines are proposed for irrigation and prominent signage will be erected to notify that irrigation water is not potable.

Sludge produced by the WWTP is collected in the sludge storage tank and periodically removed and transported by a suitably licensed waste carrier, for offsite disposal at a licensed facility in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004*.

4.4.4 Fuel Storage and Workshop

Diesel fuel storage at the premises consists of 3x 200 kL (600 m^3 in aggregate) double skinned storage tanks. One tank provides diesel for light vehicles (**LV**), mobile equipment and haul trucks and two of the tanks are for the bunkering facility. All hydrocarbon transfer points include concrete aprons to contain spills.

Smaller volumes of diesel (total of 5.92 kL (5.92 m^3)) are stored within the materials handling facility.

An oily water separator services the LV bowser pad sump and diesel unloading area, where oily substances are separated out into a waste oil tank and the water is transferred to the sedimentation pond.

Fuel bunkering activities to TSVs include couplings which meet bunkering standards and requirements, and bunkering operations are intermittent.

Total fuel storage within the Premises Boundary remains below the Schedule 1 (Part 2) production or design capacity for Category 73. Dangerous Goods Site Licences as required by the *Dangerous Goods Safety Act 2004* and Regulations is provided in **Attachment 5**.

4.4.5 Stormwater Drainage and Sedimentation Basin

An unlined sedimentation basin has been constructed in accordance with W6713. The sedimentation basin has storage capacity of up to 23,700 m^3. The sedimentation basin has been constructed to manage at a minimum, the volume of a year average recurrence interval (**ARI**), 1 hour inflow volume, including 500 millimetre (**mm**) freeboard.

The stormwater network collects stormwater runoff from the landside facility via a series of drains and culverts (**Attachment 3B**). The presence of seawalls around the Landside Facility and sandy soils (approximate infiltration rate of 0.8 to 0.9 m/day) aims to prevent site stormwater from freely flowing into the ocean.

Intermediate sumps around the premises drain to the main drive-in sump, which drains to the sedimentation basin, intermediate sumps are located at the thru load feeder, in loading conveyor, truck unloading feeder, out-load conveyor and wharf conveyor. Additionally, there are intermediate drive-in sumps at CV03/04 and CV01/02 transfer stations that collect runoff and washdown water and transfer to the main site drive-in sump.

The outlet structure of the sedimentation basin consists of two grated inlets at 1.3m and 1.5m above the base of the basin. The raised graded inlets are designed to allow for discharge to only occur during emergency situations. A low flow drainage pipe has been installed at the base of the sedimentation basin to allow for the controlled and progressive drainage of the basin over a period of up to 96 hours after a storm or similar tidal events. Discharge water is directed to the tidal flats to the south of the premises beyond the southern seawall.

The sedimentation basin outlet structure consists of a rock armoured apron to dissipate discharge energy and reduce erosion impacts and the outflow culverts have been fitted with tide valves on the outlets to control passive storage volume of the basin and act as a barrier to tidal/storm surge influences.

Water level markers / sediment depth markers have been installed on the embankment of the sedimentation basin to determine available capacity of the sedimentation pond. Maintenance will be undertaken at the sedimentation basin as required, and at a minimum when the basin capacity is reduced by more than 30%. Maintenance includes, but is not limited to, excavation of excess solid material with waste material disposed of at an appropriate offsite facility or returned to temporary onsite waste storage.

Table 6: Other Infrastructure (not prescribed)

Key Infrastructure and Equipment		Operational Requirements to minimise / manage emissions
Desalination Plant	• Feed water tank and pump • Permeate storage tanks • Seawater pump and transfer pipes • Potable water storage tank • Brine holding tanks • Brine transfer pump • RO membrane • Disc filtration system • Containerised Ultra filtration system with external tanks • Self bunded hypochlorite storage tank	• Discharge of brine will be managed in accordance with MS 1204 Conditions B2-1 and B2-2 and the MOEMMP. • The desalination plant will be operated and maintained in accordance with manufacturer specifications.
Power Station	• 14 MW gas fired power station • 9x 1.56 MW generators and exhausts in purpose-built engine hall with internal drainage • Lube oil system	• The power station will be operated in accordance with manufacturers specifications.
WWTP	• 9m^3/day WWTP (Biocombi Unit and feed pump) • Primary settling tanks A and B • Effluent tank • Sludge tank • Sludge pump, irrigation pump, transfer pump, recirculation pump • Influent screen • Treated effluent tank • Irrigation stations	• The WWTP will be managed in accordance with DoH and PPA requirements. • The WWTP will be maintained in accordance with manufacturer specifications. • Excess treated effluent that is co-disposed with brine and discharged to the marine environment will be managed in accordance with MS 1204 Conditions B2-1 and B2-2 and the MOEMMP.
Fuel Storage	• 3x 600 kL (600 m^3) double skinned diesel tanks • Diesel unloading bay • Oily water separator / waste oil storage • Refuelling bay / LV bowser	• Operation of fuel storage infrastructure will be in accordance with PPA requirements and the Dangerous Good Storage Licence. • Spill kits will be maintained onsite. • All spills will be contained and cleaned up and reported in accordance with PPA requirements.

Key Infrastructure and Equipment		Operational Requirements to minimise / manage emissions
	• Diesel transfer pumps • Diesel bunkering pumps	
Sedimentation Basin and drainage infrastructure	• Unlined sedimentation basin designed with a 1 year ARI, 1 hour inflow volume • Rock armoured apron at sedimentation basin discharge outlet/s • Water level markers / sediment depth markers within the sedimentation basin • Oily water separators at LV bowser pad sump and diesel unloading area	• Culverts and drains to direct stormwater into sedimentation basin. • Sedimentation basin operated with minimum 500 mm freeboard at all times. • Sedimentation basin will be excavated of excess material when basin capacity is reduced by more than 30%. Excavated material will be disposed to an appropriate offsite facility or contained and stored temporarily onsite until removed offsite. • During emergency situations, water contained within the sedimentation basin will be discharged via the discharge outlet/s. • Discharge outlets fitted with tidal valves to control passive storage volume. • The sedimentation basin outflow culverts are fitted with raised inlets / concrete pits that act as overflow weirs to control the passive storage volume available, for sediment settlement. • Groundwater around the sedimentation basin will be sampled every 6 months in accordance with AS/NZS 5667.1 and AS/NZS 5667.11, results will be compared to baseline sample results and the Australian and New Zealand 2018 Guidelines (**ANZG 2018**) for Fresh and Marine Water Quality where relevant. • Water from the sedimentation basin will be sampled quarterly and prior to overflow events, and analysed for total recoverable hydrocarbons (**TRH**), benzene toluene, ethylbenzene and xylenes (**BTEX**), pH and total suspended solids (**TSS**). • Regular visual inspections of the sedimentation basin, discharge outlet and site drainage will be undertaken.

5. EMISSIONS AND DISCHARGES

The potential emissions, discharges and wastes produced by the prescribed activity and auxiliary activities are discussed in the following sections. The primary emissions being potential dust emissions.

5.1 EMISSIONS TO AIR – DUST

Key emission sources where dust would be generated during the materials handling process are associated with:

- Material unloading from road trains (truck unloading shed) (tipping stations / in-loaders hoppers and feeders)
- Transfer stations (CV01 and CV03) and conveyors (in-loading conveyor CV01 out-loading conveyor CV03); and
- Ship loader (SHL01) and out-loading conveyor (CV04).

5.1.1 Air Quality Modelling

Air quality modelling was undertaken by Environmental Technologies and Analytics (**ETA**) to assess the potential operational air quality impacts associated with the landside and nearshore facility. The Air Quality Assessment Report is provided in **Attachment 8**. The modelling was undertaken for two scenarios:

- Scenario 1 - AIP with operations at 30 Mtpa (4 in-loaders)
  - AIP Project only (in isolation of other sources)
  - AIP Project inclusive of background air quality (i.e. cumulative impact)
- Scenario 2 - AIP with operations at 40 Mtpa (4 in-loaders)
  - AIP Project only (in isolation of other sources)
  - AIP Project inclusive of background air quality (i.e. cumulative impact)

For the purpose of the Licence Application, only the model predictions for Scenario 2 (40 Mtpa) are detailed herein. Additionally, it is recognised that there are no sensitive human receptors located within 10 km of the premises. The nearest sensitive land use (infrastructure) is located approximately 1.5 km to the southwest (Chevron Wheatstone Processing Facility).

The modelling assessment determined the potential air quality impacts associated with the proposed port operations. Modelling impacts of particulates (as TSP, PM_{10}, $PM_{2.5}$ and deposition) was undertaken using the CALMET/CAPUFF modelling suite. Three-dimensional meteorological fields in the region were created, in the absence of weather station data, from 3-dimensional data generated by the Weather Research and Forecasting (**WRF**) prognostic meteorological model. Fine resolution terrain elevation (SRTM) data with 90 m resolution was used in conjunction with ESACCI land-use data to characterise the geophysical environment.

The emission sources used in the air quality model for volume sources are further detailed the Air Quality Assessment (ETA 2022) included in **Attachment 8**. Proposed emission controls were also included the emissions estimation.

5.1.1.1 Background Concentrations

There was no ambient particulate monitoring data for the Onslow region publicly available for the air quality assessment. Data from the Port Hedland Industries Council (**PHIC**) Yule River monitoring station, has been assumed to be a reasonable proxy or approximation for PM_{10} and $PM_{2.5}$ (**Table 7**).

Although this monitor is located approximately 380 km to the northeast of the AIP port area, the data can be considered to be representative of the background particulates in a coastal location in the Pilbara region.

Table 7: Background Air Quality for Assessment (ETA 2022)

Parameter	Averaging Period	Concentration	Reference
PM_{10}	24-hour	21.4 µg/m^3	Yule River FY16 70th percentile
	Annual	18.5 µg/m^3	Yule River FY16
$PM_{2.5}$	24-Hour	7.8 µg/m^3	Yule River FY16 70th percentile
	Annual	6.0 µg/m^3	Yule River FY16
Total Suspended Particulates (TSP)	-	-	Not available
Dust Deposition	-	-	Not available

5.1.1.2 Air Quality Assessment Criteria

The assessment criteria used in the Air Quality Assessment (ETA 2022) for the AIP are primarily based on the DWER (2019) guidelines, which also reference the numerical values from the ambient air quality standards specified in the Ambient Air Quality NEPM (NEPC, 2021) (**Table 8**). DWER (2019) guidelines do not address the settling or deposition of dust, therefore the New South Wales and Victorian State Government specified criteria is referenced.

Table 8: Air Quality Assessment Criteria (ETA 2022)

Pollutant	Air Quality Assessment Criteria				Reference
	Concentration	Averaging Period	Allowable Exceedances	Env Value Protected	
PM_{10}	50 µg/m^3	24-hour	Exception event	Human health	DWER (2019) consistent with NEPM (NEPC, 2021)
	25 µg/m^3	Annual	None		
$PM_{2.5}$	25 µg/m^3	24-hour	Exception event		
	8 µg/m^3	Annual	None		
TSP	90 µg/m^3	24-hour	None	Human health	DWER (2019)
Dust deposition	2/g/m^2/month	Month	Maximum increase above background	Amenity/ Nuisance	EPAV, 2007

5.1.1.3 Air Quality Model Predictions and Impact Assessment

The statistics of the predicted ground level concentrations of PM_{10}, $PM_{2.5}$ and TSP for the Project operating at 40 Mtpa (i.e. four in loaders) at the nearest sensitive receptors for amenity/nuisance (industrial receptor: Chevron Wheatstone facility, ~1.5 km from proposed Prescribed Premises) and human health and amenity (Chevron accommodation camp ~10 km, Onslow 1 and Onslow 2 ~

10.5 km from proposed Prescribed Premises) are presented in the following section and **Table 9** through to **Table 12**.

The potential air quality impacts associated with the port operations have been considered in isolation to other emissions sources as well as in conjunction with background air quality and existing emissions sources to represent cumulative impacts. Modelled ground level concentrations for particles have been compared to ambient air quality assessment criteria to determine the potential changes in ground level concentrations resulting from the AIP.

PM_{10} (**Table 9**)

The maximum predicted 24-hour concentration, from the Project (i.e. without background), is predicted to be 22.2 µg/m^3 at the Chevron Wheatstone receptor and increases up to 43.6 µg/m^3 when the background concentration is included for potential cumulative impact.

The predicted concentration at the Chevron receptor approaches but does not exceed the PM_{10} assessment criterion.

The maximum predicted concentration, without background (i.e. Project only), at the receptors within Onslow is 2.2 µg/m^3 increasing up to 23.6 µg/m^3 for cumulative when the background concentration is included.

No excursions of the $PM_{2.5}$ assessment criteria are predicted to occur.

$PM_{2.5}$ (**Table 10**)

The maximum predicted 24-hour concentration, for Project only, is predicted to be 6.7 µg/m^3 at the Chevron Wheatstone receptor, which increases up to 14.5 µg/m^3 when the background concentration is included.

The predicted concentration at the Chevron Wheatstone receptor is well below the assessment criteria for $PM_{2.5}$.

The maximum predicted concentration, without background (i.e. Project only), at the receptors within Onslow is 0.7 µg/m^3 increasing up to 8.5 µg/m^3 for cumulative when the background concentration is included.

No excursions of the $PM_{2.5}$ assessment criteria are predicted to occur.

TSP (**Table 11**)

There is no exceedance of the TSP assessment criterion at any of the nominated sensitive receptors.

For cumulative impacts, the inclusion of a background concentration of 42.8 µg/m^3 increases the predicted 24-hour TSP concentration at the Chevron Wheatstone receptor to 100.5 µg/m^3. Although this is above the assessment criteria, the Chevron receptor is not classified as a sensitive receptor.

Dust Deposition (**Table 12**)

The criterion for potential deposition effects (2 g/m^2/month), is not exceeded at any nominated sensitive receptor.

Table 9: Predicted PM_{10} Concentrations at Nearest Receptors (µg/m³) (ETA 2022)

Receptor	Static					
	Maximum	99th Percentile	95th Percentile	90th percentile	70th percentile	Average
Project only						
Chevron Camp	0.9	0.4	0.3	0.0	0.0	0.0
Onslow 1	2.0	1.1	0.7	0.3	0.2	0.1
Onslow 2	2.2	0.7	0.6	0.3	0.1	0.1
Salt 1	4.8	1.9	1.7	0.7	0.1	0.2
Salt 2	4.1	2.2	1.2	0.5	0.2	0.2
Chevron Wheatstone	22.2	6.2	5.3	1.5	0.3	0.6
Cumulative						
Chevron Camp	22.3	21.8	21.7	21.4	21.4	18.5
Onslow 1	23.4	22.5	22.1	21.7	21.6	18.6
Onslow 2	23.6	22.1	22.0	21.7	21.5	18.6
Salt 1	26.2	23.3	23.1	22.1	21.5	18.7
Salt 2	25.5	23.6	22.6	21.9	21.6	18.7
Chevron Wheatstone	43.6	27.6	26.7	22.9	21.7	19.0

Table 10: Predicted $PM_{2.5}$ Concentrations at Nearest Receptors (µg/m³) (ETA 2022)

Receptor	Static					
	Maximum	99th Percentile	95th Percentile	90th percentile	70th percentile	Average
Project only						
Chevron Camp	0.3	0.2	0.0	0.0	0.0	0.1
Onslow 1	0.6	0.4	0.1	0.1	0.0	0.04
Onslow 2	0.7	0.2	0.1	0.1	0.0	0.03
Salt 1	1.5	0.6	0.3	0.2	0.0	0.07
Salt 2	1.2	0.7	0.2	0.2	0.1	0.07
Chevron Wheatstone	6.7	2.3	1.1	0.5	0.1	0.19
Cumulative						
Chevron Camp	8.1	8.0	7.8	7.8	7.8	7.8
Onslow 1	8.4	8.2	7.9	7.9	7.8	7.8
Onslow 2	8.5	8.0	7.9	7.9	7.8	7.8
Salt 1	9.3	8.4	8.1	8.0	7.8	7.9
Salt 2	9.0	8.5	8.0	8.0	7.9	7.9
Chevron Wheatstone	14.5	10.1	8.9	8.3	7.9	8.0

Table 11: Predicted TSP Concentrations at Nearest Receptors (Mg/m³) (ETA 2022)

Receptor	Static					
	Maximum	99th Percentile	95th Percentile	90th percentile	70th percentile	Average
Excluding background						
Chevron Camp	2.3	1.4	0.4	0.1	0.0	0.1
Onslow 1	5.1	3.1	1.2	0.8	0.4	0.4
Onslow 2	5.7	1.9	1.1	0.7	0.3	0.3
Salt 1	12.5	5.5	3.0	1.7	0.3	0.6
Salt 2	10.7	6.4	2.2	1.3	0.5	0.6
Chevron Wheatstone	57.7	19.7	9.0	4.0	0.7	1.6
Including background						
Chevron Camp	45.1	44.2	43.2	42.9	42.8	42.9
Onslow 1	47.9	45.9	44.0	43.6	43.2	43.2
Onslow 2	48.5	44.7	43.9	43.5	43.1	43.1
Salt 1	55.3	48.3	45.8	44.5	43.1	43.4
Salt 2	53.5	49.2	45.0	44.1	43.3	43.4
Chevron Wheatstone	100.5	62.5	51.8	46.8	43.5	44.4

Table 12: Predicted Dust Deposition at Receptors (g/m²/month) (ETA 2022)

Receptor	Maximum
Onslow 1	0.003
Onslow 2	0.004
Camp	0.001
Salt 1	0.015
Salt 2	0.015
Chevron Wheatstone	0.042

5.1.2 Air Quality Monitoring During Environmental Commissioning

Dust emission controls detailed in this document were operated during environmental commissioning activities and air quality monitoring was undertaken during this period. Three telemetry units were utilised during environmental commission in accordance with Environmental Commissioning Conditions detailed in W6713, and air quality monitoring will continue to be undertaken during continual operations.

One monitoring unit was located on the premises, one unit was located at Chevron Wheatstone Camp and one unit was located at Onslow Salt. The units onsite and at the Chevron Wheatstone Camp incorporate real-time monitoring of wind speed, wind direction, relatively humidity, barometric pressure and temperature. The unit installed at Onslow Salt does not incorporate these monitoring functions, however it is positioned adjacent to a standalone weather station from which this data can be obtained. The monitoring equipment aligns with the methodology specified by Australian and New Zealand Standard AS/NZS3580.9.17:2018 for dust monitoring.

Particles as PM_{10} were monitored on a continuous 10-minute average period, with automated notifications when more than two exceedances of 120ug/m³ in a ten-minute timeframe. Over the duration of the environmental commissioning period, events where two exceedances of 120 ug/m³ over a 10-minute period occurred are summarised in **Table 13**. Exceedances were investigated and predominately attributed to routine maintenance being carried out on the dust monitors monthly (resulting in false alerts) or coincided with events such as stormfronts / increased wind or dust - storms over the region. Where exceedances were identified to be related to operational activities, the activities were reduced or ceased and additional mitigation strategies were implemented, including use of a water cart.

Additionally, when PM_{10} exceedances occurred a dust sample from a dust deposition gauge located at the prevailing windward side of the facility were submitted to an accredited laboratory to identify the analytes of the sample. In all cases, the samples were comprised of silica and calcium carbonate deposits rather than iron oxide, further suggesting the exceedances were the result of climatic events and naturally occurring dust loading on the area.

Table 13: Summary of exceedances from air quality monitoring during environmental commissioning activities

Dust Monitoring Stations	Dust Monitoring Station Location	Number of events where 2 or more readings of 120ug/m^3 occurred in 10-minute period (21/03/2024 to 21/03/2025)
Dust Monitoring Station 1	Port of Ashburton	213
Dust Monitoring Station 2	Onslow Salt	29
Dust Monitoring Station 3	Wheatstone Accommodation Camp	138

Monitoring during environmental commissioning activities indicates that emissions controls for dust abatement are adequate to minimise dust emissions related to the materials handling infrastructure and will continue to be used for ongoing operations.

The Environmental Commissioning Report will be submitted to DWER in accordance with Condition 16 of W6713.

5.1.3 Proposed Operational Controls

The infrastructure has been specifically designed to maximise the suppression and capture of dust emissions. This includes the use of covered conveyors, semi-enclosed truck tipping station, storage sheds for reclaiming of ore, enclosed transfer station and a dust collector system. Further detail of the dust controls that are proposed for continual operations are summarised in **Table 3**.

5.2 EMISSIONS TO AIR – NOISE

Noise will be generated from the operation of the Bulk Handling Facility. Key emission sources are associated with the following:

- Haul truck movement.
- Movement / operation of closed conveyors, conveyor drives.
- Dumping of ore.
- Air extraction.
- Operation of mobile machinery such as front-end loaders.
- Operation of the Power Station and other auxiliary infrastructure.

5.2.1 Noise Modelling

A noise assessment was undertaken for the AIP, including operational noise from the Port (Lloyd George 2021) (**Attachment 8**). Computer modelling was used to predict noise levels at each nearby receiver. The software used was *SoundPLAN 8.2* with the CONCAWE algorithms selected. These algorithms were selected as they include the influence of wind and atmospheric stability. Input data for the model included:

- Meteorological information.
- Topographical data.
- Ground absorption.
- Source sound power levels.

Worst case meteorological conditions were utilised for noise propagation and sound power levels for each identified source of noise emission.

The predicted noise level at the boundary of the Wheatstone Facility (closest receptor), assuming the worst-case meteorological scenario, is 58 LA_{10} decibels (**dB**), which is compliant with the Industrial assigned level of 65 LA_{10} dB (Lloyd George 2021).

TSV loading activities are expected to have very low levels of noise due to the product in the holds of the vessel structure and as a result dampening any noise associated with these activities (Talis 2022). No significant impact is posed to marine fauna from operational noise emissions.

5.2.2 Proposed Operational Controls

Compliance with *Environmental Protection (Noise) Regulations 1997* and regular maintenance of equipment and other sources of noise emissions.

5.3 EMISISONS TO AIR – GASEOUS EMISSIONS

The 14 MW gas fired power station will contribute to combustible gas emissions (nitrogen oxides (NO_2)). Modelled air quality predictions for NO_2 from the Power Station include:

- The predicted annual average and maximum 1-hour ground level concentrations are well within the relevant assessment (**NEPM**) criteria for the facility operating in isolation.
- The annual and 1-hour assessment criteria are not exceeded at any nominated sensitive receptor when cumulative emissions are included in the modelling (ETA 2022).

The production or design capacity threshold for the Power Station is below the threshold for Prescribed Premises Category 52.

5.3.1 Proposed Operational Controls

The power station will be maintained in accordance with manufacturers specifications.

5.4 EMISSIONS TO AIR – ARTIFICAL LIGHT

Light pollution during operation has the potential to disrupt marine turtle behaviour, including nesting adult females and hatchlings on surrounding islands an onshore hatching marine turtles. Bright lighting can disorient flying birds and subsequently cause their death through collision with infrastructure or starvation due to disruptions in the ability to forage at sea (DSEWPaC 2012).

Related light sources are associated with storage and loading infrastructure as well as supporting auxiliary infrastructure. The landside and nearshore facilities are expected to have a total of 248 LED luminaires resulting in a total lumen output of 2,427,500 lumens.

5.4.1 Proposed Operational Controls

Lighting design has been managed in line with the (DotEE, 2020), the WA EPA Environmental Assessment Guideline: Marine Fauna (EPA 2016) and the WA Environmental Protection Authority Environmental Assessment Guideline No. 5 Protecting Marine Turtles from Light Impacts (EPA 2010).

Operational light will be reduced through the implementation of best practice measures as outlined in the Artificial Light Management Plan (ALMP, **Attachment 8**), as required by Condition 10 of EPBC: 2021/9064 and MS 1204 Condition B3-4.

5.5 EMISSIONS TO LAND AND WATER

5.5.1 Discharge of Water from Sedimentation Basin

Stormwater runoff generated within the premises will flow through the internal stormwater drainage system and be directed to the sedimentation basin. Some water contained in the sedimentation basin will be lost to infiltration; however, the volume lost to infiltration is not expected to be significant given the fine sediments that will collect in the pond and reduce seepage through the underlying sands.

In the event that sumps located around the premises reach capacity during washdown activities, overflow is directed to the sedimentation basin, which may lead to increase volume of sediment laden water into the sedimentation basin.

Surplus water in the sedimentation basin will be discharged during emergency events via the outlet structure to the tidal flats south of the site to be diluted with seawater. In the event of an emergency such as extreme weather events, two grated inlets at 1.3 m and 1.5 m above the base of the pond will direct emergency overflows to vacant land beyond the southern seawall of the premises.

Potential impacts from discharge of water from the sedimentation basin include:

- Turbidity and sediment deposition to the receiving environment if sediments have not settled out during storage in the sedimentation basin.
- Erosion and scouring at the discharge point.
- Hydrocarbon contamination to the receiving environment from runoff from fuel storage and refuelling areas.

5.5.1.1 Proposed Operational Controls

Clean stormwater runoff is separated from potential oily water runoff through the oily water treatment system LV bowser pad sump and diesel unloading area. Water from the sedimentation basin, including discharge water was sampled on four occasions during environmental commissioning and analysed for TRH. Lab results did not detect concentrations of TRH above laboratory reporting limits. The oily water separator will be maintained regularly in accordance with manufacturer specifications and ongoing operation monitoring of the water contained in the sedimentation basin will continue during operations.

The sedimentation basin outlet structure consists of a rock armoured apron to dissipate discharge energy and reduce erosion impacts.

Additional operational controls are detailed in **Table 6.**

5.5.2 Discharge of Brine to the Marine Environment

This activity has been assessed under Part IV if the EP Act and will be managed in accordance with MS 1204 and the MOEMMP (**Attachment 5**).

5.5.3 Accidental Spillage of Ore Product

General operations, including TSV loading and wharf activities have the potential for accidental product spillage from conveyors, transfer points and other ore handling equipment.

5.5.3.1 Proposed Operational Controls

Cargo handling infrastructure has been designed to industry best practice to minimise spillage. TSV will be subject to operational procedures and will be operated within the requirements of the existing Port of Ashburton requirements as stipulated by PPA and directed by the Harbour Master. Typical measures required to reduce spillages include landside cargo handling procedures. All activities relevant to vessel operations will be managed in accordance with existing PPA policies and procedures for the Port. These activities are therefore considered low risk as the existing management is considered industry best practice.

5.5.4 Unauthorised discharges - fuel spills, washdown water, raw sewage spills – other activities (not prescribed)

Unplanned release of Fuel / Oil

Fuel unloading, storage, delivery and bunkering activities have the potential to lead to unauthorised discharges of hydrocarbons to land and the marine environment. A Port Diesel Storage Facility Hazard ID was undertaken to identify hazards and unwanted events resulting from fuel storage and associated activities as well as identify controls to mitigate the hazards.

The use of hydraulic equipment onsite and storage of other chemicals and waste oils also has the potential lead to unplanned leaks that could enter the surrounding land or marine environment. Regular maintenance and servicing of infrastructure and equipment will reduce the risk of potential leaks and spill kits will be maintained onsite.

Potentially contaminated washdown water

Regular maintenance activities will involve ensuring the material handling infrastructure is free from product build up. Maintenance activities may include product recovery, washdown of the conveyors or other infrastructure. Sediment laden washdown water or water containing product residue from wash down activities is directed to local sumps where it is then discharged to the sedimentation basin. Where possible, iron ore product recovered during maintenance will be fed back into the materials handling system for export. Wet sludge from the sumps will be temporarily stockpiled for drying (ensuring moisture levels are maintained within the DEM range) in dedicated areas prior to removal offsite.

The washdown water has the potential to contain excess ore residue which has the potential to overflow in the marine environment, particularly during wharf conveyor washdown activities. In the event that excess residue in washdown water enters the marine environment, the PPA will be notified and remediated as per the direction of PPA. The SDS for the fines product to be shipped states that the iron ore fines are classified as non-hazardous, the ecotoxicity of the product is ‘not toxic’ and there are no environmental hazards listed on the SDS under Section 14 – Transport Information.

Additionally, nearshore marine sediment sampling is undertaken in accordance with MOEMMP.

Unplanned release of Raw Sewage

Potential unauthorised discharges to land and the marine environment from the WWTP include:

- Spills/ leaks of raw sewage, treated effluent and sludge.
- Spills / leaks of treated effluent.

The WWTP is installed with systems to monitor the tank volume levels, an alarm system will notify the operator of high-risk volumes and reduce the risk of an overflow event occurring.

6. WASTES

6.1 BAGHOUSE FILTERS

The baghouse filters and any dust residue, which will entirely consist of inert iron ore dust, will be removed from the dust extraction system as often as required to allow full operations to be in accordance with the manufactures specifications. The waste will be removed from site with waste product sludge.

6.2 EXCESS SLUDGE - WWTP

Sludge produced by the WWTP will be collected in the sludge storage tank and periodically removed by a suitably licensed waste carrier for offsite disposal at a licensed facility. Sludge will be collected, and transport and disposal of sludge will be undertaken in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004*.

6.3 EXCESS SOLID MATERIAL

During maintenance activities, wet product that has been recovered from sumps or recovered from cleaning of the materials handling facility may require drying prior to feeding back into the system for export. Dedicated areas onsite will be used for drying of product including a windrowed concrete or compacted earthen drying pad. Temporary stockpiles of sludge will be maintained below 2 m and moisture levels will be maintained within the DEM range, and will be visually monitored for dust.

The stormwater draining to the sedimentation basin is likely to carry with it some solid material. This material can build up over time and reduce the capacity of the sedimentation pond as well as impact on the effective operation of the discharge pipes. The basin will be regularly inspected, and if the excess solid material has reduced the basin capacity by more than 30% it will be excavated, stored onsite temporarily before being disposed to an appropriate offsite location if it cannot be fed back into the materials handling circuit.

6.4 WASTE OIL, WASTE LUBRICANTS

Any waste oil and waste lubricants generated during maintenance activities will be stored in appropriate storage units for collection and disposed offsite in accordance with *Environmental Protection (Controlled Waste) Regulations 2004*.

Waste oil from oily water separators will be periodically removed by licensed vacuumed truck and disposed off-site in accordance *Environmental Protection (Controlled Waste) Regulations 2004*.

6.5 CONTAMINATED SOIL

Any soils contaminated by hydrocarbon or chemical spills will be immediately removed and stored in an appropriate storage area, until removal and disposal at an appropriate offsite licensed waste facility will be undertaken by a licenced contractor. If required, soil validation sampling will be undertaken to confirm all contaminated material has been removed.

7. STAKEHOLDER ENGAGEMENT

7.1 KEY STAKEHOLDERS

The Applicant has identified the key stakeholders for the Project are listed in **Table 14.** The Applicant recognises the value of building relationships with key stakeholders and the communities in which it is active. Stakeholder engagement is a continuing and ongoing and part of the larger AIP. Regular meetings are held with PPA to discuss requirements and provide updates. The AIP has been widely discussed with the key stakeholders.

Table 14: Key Stakeholders

Stakeholders
Australian Government Agencies
Department of Climate Change, Energy, the Environment and Water (**DCCEEW**)
State Government Agencies & Members of Parliament
Conservation Council WA
Department of Biodiversity, Conservation and Attractions (**DBCA**)
Department of Jobs, Tourism, Science, and Innovation (**JTSI**)
Department of Planning, Lands and Heritage (**DPLH**)
Department of the Premier and Cabinet (Minister for Water and Environment)
Department of Primary Industries and Regional Development (**DPIRD**)
Department of Transport (**DoT**)
DWER - Regulation
DWER – Environmental Protection Authority Services (**EPAS**)
Development WA (**DevWA**)
EPA
Main Roads WA (**MRWA**)
PPA
Telstra
Local Government
Shire of Ashburton
Traditional Owners
Buurabalayji Thalanyji Aboriginal Corporation (Thalanyji)
Private Industry
Chamber of Minerals and Energy (**CME**)
Chevron Australia Pty Ltd
KUFPEC Australia (Julimar) Pty Ltd Kyushu Electric Wheatstone Pty Ltd
Finder No 3 Pty Ltd
Mackeral Islands Pty Ltd
Mineral Edge Pty Ltd
Mobil Resources Company Pty Ltd

Stakeholders
Onslow Chamber of Commerce and Industry (**OCCI**)
Onslow Marine Support Base
Onslow Salt
Wheatstone Pty Ltd
Pilbara Development Commission
SapuraOMV Upstream (Western Australia Pty Ltd)
Santos Offshore Pty Ltd
Strike Resources
Shell Australia Pty Ltd
Regional Development Australia
Rio Tinto
WA Fishing Industry Council (**WAFIC**)
Woodside Energy
Community
Bird Life Western Australia
Onslow Community
Wildflower Society

8. SITING AND LOCATION

8.1.1 Sensitive Receptors and Environmentally Sensitive Areas

A summary is provided in **Table 15** and shown in **Attachment 7**.

Table 15: Sensitive Receptors and Environmentally Sensitive Areas

Type / Classification	Description	Distance from Premises	Context
Human Receptors			
Aboriginal and other heritage sites	Thalanyji (WCD2008/003) Native Title Area	The Landside portion of the premises occurs within the Thalanyji (WCD2008/003).	A Cultural Heritage Management Plan has been developed for the AIP in consultation with Buurabalayji Thalanyji Aboriginal Corporation (BTAC), the registered Native Title Body Corporate for the Thalanyji People, as required by conditions of MS 1204.
	Registered Site – Wheatstone 1. (Place ID 28713)	Approximately 736 m from the premises boundary. This site was subject to Section 18 (s18) consent under the Aboriginal Heritage Act 1972 (DPLH Ref# 34-13812) to disturb and subsequently salvaged as per the consent conditions.	Is no longer extant. No longer requires management or mitigation.
Industrial Developments	Chevron Wheatstone Gas Processing Facility	The Chevron facility boundary is located immediately to the southwest of the premises, approximately 400 m. Train 1 within the facility is approximately 1.5 km southwest and the gas turbines are approximately 2.1 km southwest.	Not considered a sensitive receptor due to the industrial nature of the site and no accommodation facilities.
Industrial Developments	BHP Macedon Gas Facility	Approximately 6 km southwest.	Not considered a sensitive receptor due to the industrial nature of the site and no accommodation facilities.
Industrial Developments	Onslow Salt	Evaporation ponds approximately 3 km southeast. Stockpile and export facilities approximately10 km northeast.	The iron ore dust can potentially impact the quality of the salt product. PM_{10} monitoring undertaken in the vicinity of Onslow Salt.

Type / Classification	Description	Distance from Premises	Context
Workforce Accommodation	Chevron Accommodation Village	Approximately 10 km southeast of premises.	PM_{10} monitoring undertaken in the vicinity of the Chevron Accommodation Village in accordance with the Terrestrial Environmental Management Plan (**TEMP**).
Residential Areas	Onslow townsite	Approximately 10.5 km northeast.	Not considered a sensitive receptor due to the distance from the premises.
Environmental Receptors			
MNES migratory birds	Shore/water bird species	The area surrounding the premises consists of Primary Dune, Claypans and Tidal Flats. These areas provide seasonal habitats for numerous Migratory Matters of National Environmental Significance (**MNES**) shore/waterbird species (360 Environmental 2021).	Managed in accordance with MS 1131.
Conservation significant species	A number of marine fauna listed under the *EPBC Act* or *Biodiversity Conservation Act 2016* (**BC Act**) have been recorded to occur around the premises, including: Humpback Whale, Australian Humpback Dolphin, Dugong, Flatback Turtle, Green, Turtle, Hawkbill Turtle, Australian Fairy Turn, Bar-tailed Godwit, Curlew Sandpiper, Eastern Curlew, Green Sawfish.	The premises is located within a biologically important area for the Flatback Turtle and Hawksbill Turtle with critical habitat for nesting and internesting for the Flatback and Green Turtles (Thevenard Island) and Hawksbill Turtle (Cape Preston to mouth of Exmouth Gulf) nearby (Pendoley Environmental 2022).	Managed under MS 1204, Condition B3 and in accordance with the MOEMMP and the Artificial Light Management Plan.
Priority Fauna	High to moderate likelihood that the Short-tailed Mouse (*Leggadina lakedownensis*) (P4), and one reptile, Maryan's Keeled Slider (*Lerista*	The area around the premises	Premises is within existing industrial area. As per MS 1131.

Type / Classification	Description	Distance from Premises	Context
	planiventralis maryani) (P1) can occur in the area surrounding the premises.		
Regionally significant mangrove area	The designated Ashburton River Delta	'Regionally Significant' mangrove area (EPA, 2001) is located on the Western extent of the Port, approximately 2.2 km from the proposed premises. Mangroves are also located approximately 200 m south-east of the premises boundary along the riverbanks of Hooley Creek (West)	Managed under MS 1131 - PPA implement approved Coastal Processes Monitoring and Management Plan which includes mangrove habitat monitoring. Under MS 873 Chevron also implement a Mangrove Algal Mat and Tidal Creek Protection Management Plan).
Environmentally Sensitive Areas	Nearest ESA is the offshore Island Nature Reserves.	The premises located approximately 21 km from the nearest island nature reserve being Direction Island, (Pendoley Environmental 2022). Many have fringing coral reefs on the seaward side. Sandy beaches support turtle rookeries and suitable beaches and sandbars support shorebirds and seabird breeding colonies. There are limited tourist accommodation facilities on Thevenard Island. The orientation and low-lying elevation of the offshore islands means that nesting turtle females have direct visibility of the Project area lighting (Pendoley Environmental, 2022)	Managed in accordance with MS 1204 and the Artificial Light Management Plan.
Marine Environment	Water quality and benthic communities and habitat	The nearshore materials handling infrastructure is predominately within the Moderate level of ecological protection (LEP) zone with the designation of a Low Ecoligical Protection Area (**LEPA**) surrounding the brine outfall diffuser.	MS 1204 defines the LEP associated with marine waters around the premises. Water quality and benthic habitats managed in accordance with MS 1204 and the MOEMMP.

Type / Classification	Description	Distance from Premises	Context
Public drinking water source areas (**PDWSA**)	Cane River Water Reserve	> 30 km to the east.	Due to the distance to the PDWSA there is no source-pathway-receptor link.
Surface Water Management Area	Premises located within the Pilbara Surface Water Area (Ashburton River SWM Subarea) (RIWI 1914)	The premises is surrounded by saline coastal flats and a number of ephemeral creeks and drainage lines exist adjacent to the project area to the east within the Ashburton River Delta e.g. Hooley Creek ~200 m south-east from premises boundary, Middle Creek and Four Mile Creek (Hooley Creek and Four Mile Creek are popular fishing spots).	The Landside portion of the premises is located largely within the controlled drainage network of the Ashburton North Strategic Industrial Area (**ANSIA**). See **Section 8.1.5**.
Groundwater	Proclaimed Pilbara Groundwater Area	Groundwater table (saline wedge) is approximately 1 m below the natural surface at the premises boundary. The groundwater is brackish to hyper-saline, near neutral to slightly alkaline in pH and also contains high levels of dissolved metals.	See **Section 8.1.6** for further information.

8.1.2 Meteorology

8.1.2.1 Climatic

The premises is located on the coastline of the West Pilbara region, near the township of Onslow. The premises and the surrounding area are classified as having a Hot Humid Summer climate and receives on average between 200 mm and 300 mm of annual rainfall (BOM, 2024) (BOM, 2024). The coastline of the West Pilbara region is the most cyclone prone region of Australia. Each year during the tropical season approximately five tropical cyclones form off the coast, with on average of two cyclones crossing the coastline (BOM, 2025). These extreme weather events generally result in wind gusts in excess of 90 km/h and heavy rainfall which has the potential to result in flooding events as well as storm surges.

8.1.2.2 Wind Direction and Strength

Wind speed averages for the Onslow Airport Station (Station ID: 005017) range from 5.5 m/s, with wind speeds below 2 m/s recorded from all directions (ETA 2022). The two dominant wind directions are westnorthwest at 8 m/s and south to south easterly between 4-8 m/s (ETA 2022). Generally, wind speeds are higher during spring and summer afternoons (**Figure 1** and **Figure 3**) than autumn and winter winds (easterly) (**Figure 2** and **Figure 4**), and as such dust lift off increases and subsequent ambient air quality is reduced during periods of higher wind speeds in an already naturally windy environment. Further detail on this is presented in the Air Quality Assessment (**Attachment 8**).

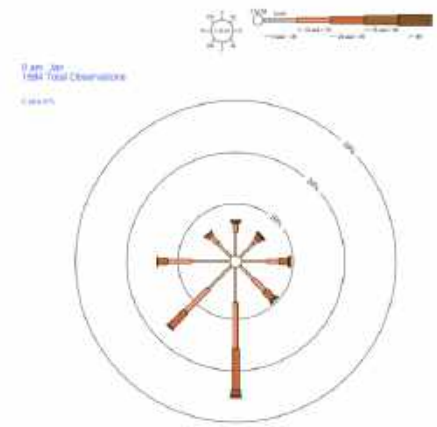

Figure 1: 9am January wind rose

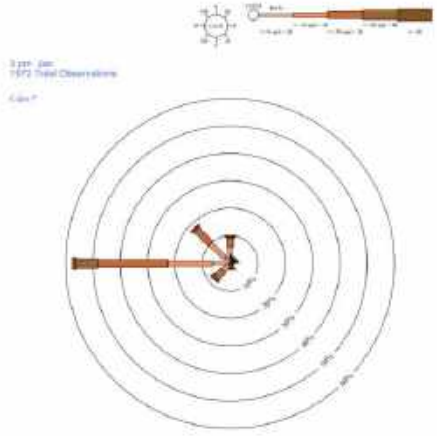

Figure 3: 3pm January wind rose

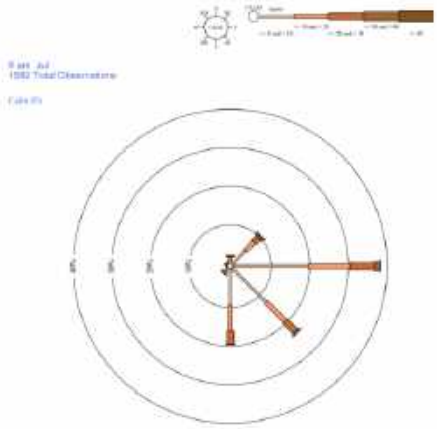

Figure 2: 9am July wind rose

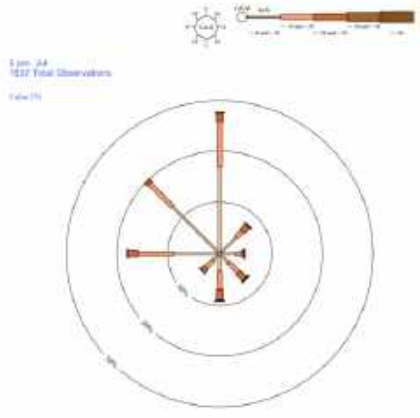

Figure 4: 3pm July wind rose

8.1.3 Oceanography

Ashburton experiences semi-diurnal tides (two highs and two lows a day) with a mean tidal range of 1.9 m in spring tides and 0.5 m in neaps (Baird 2020). The maximum velocity of the tidal current in the project area is variable (Baird 2020), with currents increasing in speed the further offshore (MRL et al., 2022).

The northwest shelf of WA experiences waves generated from three primary sources: Indian Ocean swell, locally generated wind-waves and tropical cyclone waves. From January to July the wave climate is locally generated sea waves from the west and northwest (MRL et al., 2022). In the wet season the wave climate is locally generated sea waves from the west and northwest. Whilst the non-cyclonic ambient wave conditions are generally mild, in contrast the strong winds in a tropical cyclone can generate extreme wave conditions.

Tropical cyclones cause an increase in water level due to storm surge, which is a dome of higher than normal sea water generated by strong winds and low atmospheric pressure (McInnes et al 2000). Waves also contribute to coastal sea levels during tropical cyclones (McInnes et al 2000).

8.1.4 Marine Environmental Quality

Environmental Values (**EVs**) and associated Environmental Quality Objectives (**EQOs**) for the Pilbara marine environment are well established in Pilbara Coastal Waters Consultation Outcome (DoE 2006). Five EVs and eight corresponding EQOs apply to the area surrounding the premises (**Table 16**).

Table 16: EVs and EQ Objectives Applicable to the Port and Surrounding Waters

Environmental Values	Environmental Quality Objectives
Ecosystem Health	EQO1: Maintenance of ecosystem integrity. EQO1 is split into four sub-objectives, being: Maximum, High, Moderate and Low **Levels of Ecological Protection** (LEPs)
Fishing and Aquaculture	EQO2: Seafood (caught) is of quality safe for human consumption. EQO3: Water quality is suitable for aquaculture purposes
Recreation and Aesthetics	EQO4: Water quality is safe for primary contact recreation (e.g., swimming and diving). EQO5: Water quality is safe for secondary contact recreation (e.g., fishing and boating). EQO6: Aesthetic values of the marine environment are protected
Cultural and Spiritual	EQO7: Cultural and spiritual values of the marine environment are protected
Industrial Water Supply	EQO8: Water quality is suitable for industrial supply purposes

8.1.5 Hydrology

The Landside portion of the Prescribed Premises is located largely within the controlled drainage network of the ANSIA. Apart from areas along the access road, the area has been previously filled and protected to provide a stable, dry development area. Site drainage is controlled in accordance with the Local Water Management Strategy (**LWMS**) (BG&E 2012) that has been approved by DWER (WAPC 2019), with strong emphases placed on ensuring industrial contaminants do not escape into the natural environment and that drainage best management

practices are utilised. Flood modelling conducted by BG&E (2021b) confirms that the Landside area may be subject to combined surface water flood and storm surges, the minimum pad height has therefore been constructed to 4.8 mAHD to protect against surface water flooding and storm surges.

8.1.6 Hydrogeology

The hydrogeology of the premises area is described as shallow (~4 to 5 m from the surface during groundwater monitoring bore installation, noting that the pad of the site is built up to 4.8 mAHD) with a generally upwards flow and is strongly influenced by the presence of seawater. The groundwater is brackish to hyper-saline, near neutral to slightly alkaline in pH and also contains high levels of dissolved metals. The level of some of these metals are in excess of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2000). As such the water is not suitable for potable or industrial use. Groundwater flows are generally upwards, indicating discharge from underlying regional formations into the water table zone (which is itself strongly influenced by local topography).

Four groundwater monitoring bores were installed during construction activities around the sedimentation pond (Monitoring Bores MRL-MB01 to MRL MB04). Results of TRH in groundwater sampled from the monitoring bores at the Port in January 2024 indicated concentrations of some TRH fractions above laboratory detection limits (**Table 17**), however below the trigger level specified in W6713.

Concentration of benzene, toluene, ethylbenzene and xylenes (**BTEX**) and methyl tert-butyl ether (**MTBE**) tested in the groundwater samples collected on 18 January 2024 indicated concentrations below laboratory detection limits (**Table 18**) (lab report is provided as **Attachment 8**).

Table 17: Groundwater Results – TRH (mg/L)

Sample ID	Date Sampled	TRH C_9-C_9	TRH C_6-C_{10}	TRH C_6-C_{10} (less BTEX) (F1)	TRH C_{10}-C_{14}	TRH C_{15}-C_{28}	TRH C_{29}-C_{36}	Total +ve TRH C_{10}-C_{36}	TRH >C_{10}-C_{16}	TRH >C10-C16 less Naphthalene F2 [CF3F2]	TRH >C_{16}-C_{34} (F3)	TRH >C_{34}-C_{40} (F4)	Total +ve TRH >C_{10}-C_{40}
Trigger Level TRH >15 mg/L													
MRL MB01	18 Jan 2024	<0.01	<0.01	<0.01	0.071	<0.1	0.12	0.19	0.078	0.078	0.14	<0.1	0.22
MRL MB02	18 Jan 2024	<0.01	<0.01	<0.01	0.071	0.1	0.18	0.35	0.074	0.074	0.19	0.16	0.42
MRL MB03	18 Jan 2024	<0.01	<0.01	<0.01	<0.05	<0.1	<0.1	<0.05	0.055	0.055	<0.1	<0.1	0.055
MRL MB04	18 Jan 2024	<0.01	<0.01	<0.01	0.064	<0.1	<0.1	0.064	0.065	0.065	<0.1	<0.1	0.065

Table 18: Groundwater Results –MTBE and BTEX (mg/L)

Sample ID	Date Sampled	MTBE	Benzene	Toluene	Ethylbenzene	Meta + para xylene	Ortho xylene	Total xylene
MRL MB01	18 Jan 2024	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.003
MRL MB02	18 Jan 2024	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.003
MRL MB03	18 Jan 2024	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.003
MRL MB04	18 Jan 2024	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.003

8.1.7 Heritage and Native Title

The premises occurs within the Thalanyji (WCD2008/003) Native Title determination. A Cultural Heritage Management Plan has been developed for the AIP in consultation with Buurabalayji Thalanyji Aboriginal Corporation (BTAC), the registered Native Title Body Corporate for the Thalanyji People as required by conditions of MS 1204.

9. RISK ASSESSMENT

A risk assessment has been prepared to identify the environmental impacts of the landside and nearshore bulk materials handling infrastructure, in accordance with the DWER Guidance Statement: *Risk Assessments* (Department of Environmental Regulation (DER) 2017). The residual risk assessment ratings are consistent with the risk assessment matrix used by DWER as shown in **Table 19**.

A summary of the environmental risks relevant to this licence amendment application, and the associated environmental controls to be implemented to reduce these risks to an acceptable level, are presented in **Table 20**Table 20**.** The risk of adverse impacts to the environment from potential emissions and discharges from the prescribed activities are able to be managed with the implementation of management controls detailed in **Table 20** so that no unacceptable risks are posed to the receiving environment.

Table 19: Risk Matrix and Criteria

	Consequence				
Likelihood	**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

Likelihood	
The following criteria has been used to determine the likelihood of the risk / opportunity occurring	
Rare	The risk event may only occur in exceptional circumstances
Unlikely	The risk event will probably not occur in most circumstances
Possible	The risk event could occur at some time
Likely	The risk event will probably occur in most circumstances
Almost Certain	The risk event is expected to occur in most circumstances

Consequence		
The following criteria has been used to determine the consequences of a risk occurring		
	Environment	**Public Health and Amenity**
Severe	• On-site impacts: catastrophic • Off-site impacts local scale: high level or above • Off-site 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	• 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

Likelihood		
	Environment	**Public Health and Amenity**
Major	• On-site impacts: high level • Off-site impacts local scale: mid-level • Off-site 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	• 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
Moderate	• On-site impacts: mid-level • Off-site impacts local scale: low level • Off-site impacts wider scale: minimal • Specific consequence criteria (for environment) are at risk of not being met	• 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
Minor	• On-site impacts: low level • Off-site impacts local scale: minimal • Off-site impacts wider scale: not detectable • Specific consequence criteria (for environment) likely to be met	• Specific consequence criteria (for public health) are likely to be met • Local scale impacts: low level impact to amenity
Slight	• On-site impact: minimal • Specific consequence criteria (for environment) met	• Local scale: minimal to amenity • Specific consequence criteria (for public health) met

Table 20: Risk Assessment, Proposed Controls and Monitoring

Source / Activities	Potential Emissions	Receptors	Pathway	Potential Adverse Impact	Proposed Controls and Monitoring	Residual Risk		
						Likelihood	Consequence	Ranking

• Material unloading from road trains (truck unloading shed) (tipping stations / in- loaders hoppers and feeders)
• Transfer stations (CV01 and CV03) and conveyors (in-loading conveyor CV01 out-loading conveyor CV03)
• Ship loader (SHL01) and out-loading conveyor (CV04).
Cat 58: Bulk Handling
	• Generation of Dust (PM_{10}, $PM_{2.5}$, TSP, Dust Deposition) / Air Quality	• Chevron Accommodation Village (~ 10 km)
		• Onslow Salt Evaporation Ponds (~ 13.0 km)
		• Designated Ashburton River Delta 'Regionally Significant' mangrove area ~ 2.2k m west
		• Hooley Creek West Mangroves ~ 200m southwest of boundary
			• Air / wind dispersion	• Impacts on health and amenity
				• Deposition onto plants and surface water potentially causing compromised ecological function and surface water quality
				• Dust deposition onto the salt evaporation pans may result in a reduction in quality of the product
					Proposed Controls
					• Ore at the premises to be maintained at or above DEM (range 5-7%).
					• Dust suppression systems to be used and maintained in accordance with manufacturers specifications
					• Ore in-loading into hoppers to occur in semi enclosed tipping station.
					• Ore product to be stockpiled and blended in ore storage and reclaim shed.
					• Dust collectors and fans to be operated.
					• Dust collector system will be maintained in good working order.
					• Maintain ore storage shed at negative internal pressure
					• Conveyor covers to be used during operations:
					  • CV01 conveyor operated with top cover, carry side/windward side covers.
					  • CV03 – conveyor operated with carry side/windward side covers and belt conveyor cover during operation
					  • CV04 conveyor operated with top covers and carry side/windward side covers.
					  • TSV loader boom conveyor operated with carry side covers and dust suppression sprays.
					• Regular cleaning and maintenance of materials handling infrastructure.
					• All building openings that are not required for ventilation purposes will be airtight sealed, as much as possible.
					Proposed Monitoring
					• Ore sampled for moisture prior to haulage to the premises.
					• Moisture testing onsite to ensure moisture content of product is at or above DEM levels.
					• Real time air quality monitoring for PM_{10} using telemetry monitoring equipment capable of monitoring PM_{10} equivalent to reference methods in AS/NZS 3580.9.17:2018.
					• Monitoring alarms to be activated when there are 2 exceedances over 120 ug/m^3 for PM_{10} in 10-minute timeframe.
					• When alerted to 2 exceedances over 120 ug/m^3 for PM_{10} in 10-minute timeframe an investigation will be undertaken. Those found to be attributed to operations within the prescribed premises boundary will be reported to DWER within 1 week and corrective actions will be implemented as required.
					• A breach will be recognised as an exceedance of the trigger level (2 exceedances over 120 ug/m^3 for PM_{10} in 10-minute timeframe), attributed to operations within the prescribed premises boundary.
						Possible	Minor	**Medium**

Source / Activities		Potential Emissions	Receptors	Pathway	Potential Adverse Impact	Proposed Controls and Monitoring	Residual Risk		
							Likelihood	Consequence	Ranking
Cat 58: Bulk Handling	• Movement / operation of closed conveyors, conveyor drives • Dumping of ore • Air extraction • Operation of mobile machinery such as front-end loaders • Operation of the Power Station and other auxiliary infrastructure	• Excessive or Unreasonable Noise	• Wheatstone Facility (~1.5 km) • Chevron Accommodation Village (~ 10 km)	• Air / windborne	• Impacts on health and amenity	**Proposed Controls** • Noise attenuating equipment on mobile machinery. • Regular maintained of equipment and other sources of noise emissions. • Adherence to *Environmental Protection (Noise) Regulations 1997*	Rare	Minor	**Low**
Cat 58: Bulk Handling	• Ship loader (SHL01) and out-loading conveyor (CV04).	• Iron ore spill into marine environment	• Marine environment and benthic communities and habitat within the Port of Ashburton	• Direct pathway or discharge	• Contamination of surface water potentially causing adverse impacts on the marine environment.	**Proposed Controls** • CV04 conveyor operated with top covers and carry side/windward side covers. • TSV loader boom conveyor operated with top cover and carry side/windward side covers. • Operations in accordance with existing PPA policies and procedures for the Port.	Possible	Minor	**Medium**
Sedimentation basin and discharges	• Excess sediment from main sedimentation basin • Sumps pumped as a slurry to the sedimentation pond	• Sediment laden stormwater	• Stormwater discharge area being the tidal flats beyond the southern seawall of the premises. • Designated Ashburton River Delta 'Regionally Significant' mangrove area ~ 2.2 km west. • Hooley Creek West and associated mangroves ~ 200 m south west of boundary.	• Overland runoff, overtopping of sedimentation basin or direct discharge to tidal flats.	• Erosion, ecosystem disturbance or adversely impacting surface water quality.	**Proposed Controls** • Rock armoured apron out discharge outlet structure to dissipate discharge energy and reduce erosion impacts. • Sedimentation basin operated with minimum 500 mm freeboard at all times. • Sedimentation basin will be excavated of excess material when basin capacity is reduced by more than 30%. • The sedimentation basin outflow culverts are fitted with raised inlets / concrete pits that act as overflow weirs to control the passive storage volume available, for sediment settlement • During emergency situations, water contained within the sedimentation basin will be discharged via the discharge outlet/s. **Proposed Monitoring** • Water from the sedimentation basin will be sampled quarterly and prior to overflow events, and analysed for TRH, BTEX, pH and TSS. • Regular visual inspections of the sedimentation basin, discharge outlet and site drainage will be undertaken	Unlikely	Slight	**Low**

Source / Activities	Potential Emissions	Receptors	Pathway	Potential Adverse Impact	Proposed Controls and Monitoring	Residual Risk		
						Likelihood	Consequence	Ranking
Hydrocarbon storage, refuelling activities • Spills during refuelling • Leaks from compromised fuel unloading, storage, delivery and bunkering activities • Waste oils and chemicals from supporting/auxiliary infrastructure/equipment	• Potentially contaminated stormwater (hydrocarbons, chemicals, saline water, slurry from sumps)	• Marine environment and benthic communities and habitat within the Port of Ashburton. • Proclaimed Pilbara Groundwater Area ~1 mbgl.	• Malfunctioning oily water separators or stormwater infrastructure draining potentially contaminated stormwater to the sedimentation pond. • Direct discharge of or potentially contaminated slurry to the sedimentation pond.	• Contamination of soil, surface water or groundwater, potentially causing adverse impacts on terrestrial ecology and the marine environment.	**Proposed Controls** • Refuelling of vehicles/machinery only to be undertake in dedicated areas with concrete aprons • Spill kits will be maintained onsite. • All spills will be contained and cleaned up and reported in accordance with PPA requirements. **Proposed Monitoring** • Groundwater around the sedimentation basin will be sampled and analysed for TRH, BTEX and heavy metals in accordance with AS/NZS 5667.1 and AS/NZS 5667.11 • Water from the sedimentation basin will be sampled regularly and prior to overflow events, and analysed for TRH, BTEX, pH and TSS. • Regular visual inspections of the sedimentation basin, discharge outlet and site drainage will be undertaken	Unlikely	Moderate	**Medium**
Washdown Activities • Excess ore residue in washdown water	• Overland runoff draining to marine environment	Marine environment and benthic communities and habitat within the Port of Ashburton.	• Direct pathway or discharge	• Ecosystem disturbance or impacting surface water quality	**Proposed Controls** • Washdown water containing excessive product residue from maintenance activities will be contained and not discharged into the marine environment.	Possible	Slight	**Low**

10. PROPOSED FEE CALCULATION

Premises component fee – operational throughput is greater than the highest threshold of more than 50,000 t/day (1,4000 fee units).

Waste: Discharges to air from Prescribed Activity has been calculated as follows.

The emission rates are estimated using recognised and accepted methods of emissions estimations included published factors from the National Pollutant Inventory (**NPI**) Emission Estimation Technique Manual (**EETM**) for Mining (Department of Sustainability Environment, Water, Population and Communities (**DSEWPaC**, now DCCEEW) 2012). Emissions for handling/transferring ore have been calculated using the default values for PM_{10} in the EETM for Mining and as used by ETA for the air quality modelling. Emission controls (for dust abatement) are included in the emission estimations, based on default factors outlined in Table 4 in the EETM for Mining (DSEWPaC 2012) (**Table 21**).

Table 21: Emission factors (source Commonwealth of Australia 2012)

Emission estimates	Emission reduction	PM10 (high moisture content) kg/year
Unloading	Partial enclosure 70%	51,600
Conveyors	Enclosure 85%	40,027
Transfer stations	Enclosure and water spray 80%	36,872
Ship loading	Luffing / slewing 75%	20,071
Total		**148,570**

Calculations assume:

148,570 kg/year escapes as fugitive dust (PM10) form the premises.

148,570 kg x 1,000 = 148,570,000grams per year

148,570,000 grams / 365/24/60 = 282.6 grams / minute

282.6 grams per minute of particulates (0.1 fee unit for each gram per minute – elsewhere in Australia).

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12. LIST OF ATTACHMENTS

- Attachment 1
  - Proof of Occupier Status
  - ASIC Company Extract
- Attachment 2 - Site Maps
  - Prescribed Premises Boundary
  - Site Map
  - PPA Licence and Lease Areas
  - Emissions and Discharges
  - Monitoring Locations
- Attachment 3B – Additional Information
  - Process Flow Diagram
  - Sedimentation Basin
  - Drainage
- Attachment 5 - Approval Decisions
  - EPBC 2021/9064 Approval Decision
  - Ministerial Statement MS1204 Decision
  - DGS023087
- Attachment 7 - Siting and Location
  - Sensitive Receptors Map
  - Sensitive Offshore Receptors Map
- Attachment 8 - Other
  - Marine OEMMP
  - SDS – Iron Ore
  - Schedule of Fines
  - ETA (2022) Air Dispersion Modelling Report

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