



Application for Licence Amendment

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

Licence Number	L4275/1982/15
Licence Holder	Mid-West Port Authority
File Number	2011/000451-4~4
Premises	Geraldton Port Part of Lot 503 on Deposited Plan 57801 GERALDTON WA 6530 As defined by the Premises maps attached to the Revised Licence
Date of Report	18 November 2024
Decision	Revised licence granted

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

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1. Decision summary

Licence L4275/192/15 is held by Mid-West Port Authority (Licence Holder) for the Geraldton Port (the Premises), located within Lot 503 on Deposited Plan 57801, Geraldton, Western Australia.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, revised licence L4275/1982/15 has been granted.

The Revised Licence issued as a result of this amendment consolidates and supersedes the existing Licence previously granted in relation to the Premises.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Premises overview

The premises is a port facility consisting of seven commercial berthing stations (berths) (Figure 1). Each berth is utilised for the handling of specific bulk material/granular products, though a number of bulk materials are not regulated under licence L4275/1982/15. These are summarised in Table 1. Most of the bulk materials handled at the premises is iron ore¹, followed by mineral sands, metal concentrates, fertiliser, and non-mineral sands.

Dedicated storage sheds are operated by third parties for specific bulk material (Figure 1). To support ship loading activities, the Licence Holder directly manages three main bulk materials handling circuits, consisting of:

1. Berth 4 bulk handling facility ship loading circuit, including a common user truck unloader²;
2. Berth 5 common user rail unloader³; and
3. Berth 5 bulk handling facility ship loading circuit.

Additionally, there are two truck unloaders and a rail unloader at the southern portion of the premises, which are utilised by third-party operators for handling of iron ore.

In the past ten years, the Licence Holder has amended licence L4275/1982/15 on several occasions to authorise the handling of new bulk materials, such as nickel concentrate (2014), manganese ore (2018), mineral sand concentrate, clean fill, fertiliser (2021), iron concentrate (2021), and lithium direct shipping ore and spodumene concentrate (2024).

A variety of waste is typically generated from bulk material handling activities, including industrial wastewater from plant and equipment washdown, as well as soils and sludge recovered from stormwater and wastewater storage and treatment facilities. Waste management and disposal at the premises is a shared responsibility between the Licence Holder and third-party berth users.

¹ Approximately at least 80% of annual total bulk material handled in recent years.

² The current common user truck unloader is reaching the end of its operational life. The Licence Holder intends to replace the facility, which was assessed and authorised under works approval W6893/2024/1.

³ The rail unloader at Berth 5 is not currently active. The Licence Holder maintains the rail unloader in readiness to begin iron ore handling as soon as it is commercially viable. The unloader facility is designed to accept product via belly dumper wagons.



Figure 1: Site layout, including berths, storage sheds, and conveyors

Licence: L4275/1982/15

Table 1: Description of berths, material handled, production capacity. and associated emission points

Berthing station	Bulk material handled	Description	Current throughput capacity (tonnes per annum) ¹	Maximum throughput capacity (tonnes per annum) ²	Associated emission points
Berth 1	----	Currently inactive. Determined to have reached end of their operational life due to age and condition, with plans for demolition in the next five years.	0	0	Stormwater outfall SW2, SW3, SW4
Berth 2					Stormwater outfall SW5
Berth 3	Export: Grain ³	Ship loading facilities, consisting of two fixed ship loaders with articulating loading arms, owned and operated by third-party for grain exports. Ship loaders are connected to grain terminal through a fully enclosed conveyor gallery.	0 ³	0 ³	Stormwater outfall SW6, SW7
Berth 4	Export: Mineral sands (zircon, ilmenite, rutile, leucoxene), garnet, talc, lithium direct shipping ore, spodumene concentrate.	Multi-user facility, equipped with mobile shiploader mounted on rails, primarily for the export of mineral sands and talc. A truck unloader and storage sheds are connected to the berth via fully enclosed conveyors and transfer towers. A partially covered conveyor with wind shielding is located on the berth to directly supply the shiploader.	1,472,482	2,750,000	Stormwater and treated washdown water outfall SW8, SW9
Berth 5	Export: Iron ore, non-mineral sands (clean fill, construction-grade sand)	Multi-user facility, equipped with rail-mounted ship loader that moves through an enclosed conveyor gallery. The berth is connected to storage sheds through enclosed conveyors and transfer towers.	2,745,419	8,850,000	Stormwater outfall SW10, SW11, SW12, SW13
Berth 6	Export: Metal concentrates (copper, lead sulphide, zinc, nickel, iron), mineral sand concentrate, bagged garnet	Multi-user facility for various purposes, equipped with wharf-based crane and rotating lifting frame for export of metal concentrates via Rotainers, and bunkering operation for import of fuel, self-discharging vessel to hopper for heavy mineral concentrate, grab bucket and hopper for fertiliser,	1,012,158	1,400,000	Stormwater outfall SW14, SW15

Berthing station	Bulk material handled	Description	Current throughput capacity (tonnes per annum) ¹	Maximum throughput capacity (tonnes per annum) ²	Associated emission points
	Import: Heavy mineral concentrate, coal, fertiliser (urea, soda ash, pot ash, phosphates [DAP, MAO, MOP]), breakbulk cargo ³ , fuel ³	and coal.			
Berth 7	Export: Iron ore	Owned and operated by third-party specifically for export of iron ore. Equipped with a ship loader that moves through an enclosed conveyor gallery. The berth is connected to storage sheds through enclosed conveyors and transfer towers.	7,589,511	10,000,000	Stormwater outfall SW16, SW17 Open dredge pond tailwater return pipe DPW1
TOTAL			12,819,570	23,000,000	----

Note 1: Based on production capacity reported for the 2021/2022 annual period.

Note 2: Design capacity, adjusted for operational constraints (e.g., operational downtime, maintenance, safe operating limits, loading/unloading rates, etc.).

Note 3: This bulk material is not regulated under licence L4275/1982/15, therefore, the production capacity does not account for handling of this material.

2.3 Application summary

On 11 December 2023, the Licence Holder submitted an application to the department to amend licence L4275/1982/15 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). Existing licence currently authorises the Licence Holder to undertake Category 58 and 58A activities at the premises up to 160,000 tonnes per day (or 16,000,000 tonnes per annual period). Through this application the following amendments are being sought:

1. Increase authorised throughput for Category 58 and 58A from 16,000,000 tonnes per annual period to 23,000,000 tonnes per annual period (with no change to existing daily limit of 160,000 tonnes per day);
2. Relocation of the Connell Road and Berth 1 air quality monitoring stations;
3. Addition of two existing stormwater discharge points SW16 and SW17 (Berth 7) to the licence;
4. Authorisation to discharge treated washdown water at stormwater discharge points SW08 and SW09 (Berth 4);
5. Addition of existing passive water quality monitoring program to the licence;
6. Addition of existing dredge pond discharge point DWP1 (Berth 7) to the licence; and
7. Addition of existing solid waste drying and storage facility (Berth 7) to the licence.

2.3.1 Throughput increase to 23 million tonnes per annum

The Licence Holder has requested an increase to the annual throughput authorised for Category 58 and 58A activities (i.e., *bulk material loading and unloading: premises on which clinker, coal, ore, ore concentrate, or any other bulk granular material is loaded onto or unloaded from vessels by an open materials loading system*) under licence L4275/1982/15. The amendment is required to facilitate increased trade activity at the port facility premises as a result of continued growth in global demand for mineral and energy commodities.

The requested throughput of 23,000,000 tonnes per annual period was derived from maximum operational capacity of existing ship-loading infrastructure at the premises. Cumulatively, infrastructure at the premises currently have a design capacity of approximately 58,000,000 tonne per annual period. However, the design capacity cannot practically be achieved due to operational constraints, such as:

- Operational downtime (e.g., equipment washdown, shift and berth handovers);
- Equipment maintenance;
- Limitations for safe operations (e.g., surge, tide, wind limits, rainfall, berth pocket declared depth, etc.);
- Storage shed capacity and associated discharge rates;
- Truck and rail unloading facility loading rates;
- Limited connectivity between storage sheds and berth.

In considering the operational constraints, the Licence Holder has derived the maximum operational throughput capacity for each berth, which is detailed in Table 1. Based on the berths that will experience the greatest increase in throughput capacity (i.e., Berth 7 at 10,000,000 tonnes increase, followed by Berth 5 at 8,850,000 tonnes increase), the premises will likely be handling a significant increase in iron ore products. Non-mineral sand handling may also increase as this product is associated with Berth 5. Handling of other bulk material products at other berths (including metal concentrates) will see relatively less increase in their throughput capacity.

The Licence Holder seeks only to maximise the operational capacity of existing infrastructure.

As a result, no new infrastructure will be constructed or operated to achieve the requested annual throughput. Furthermore, the amendment requested only relates to an increase of 7,000,000 tonnes to annual throughput, to a maximum of 23,000,000 tonnes per annual period. The existing daily throughput of 160,000 tonnes will not change as a result of this amendment. As such, it is likely that existing daily operations will remain relatively unchanged, though bulk material handling activities will likely be undertaken at over more days throughout the year.

To support this increase in annual throughput, the Licence Holder has undertaken dust and noise modelling assessments, as well as implemented a number of marine monitoring programs, which the Licence Holder has requested to be amended onto licence L4275/1982/15.

2.3.2 Relocation of air quality monitoring stations

To better manage fugitive dust emissions as a result of bulk material loading and unloading activities at the premises, the Licence Holder currently operates an air quality monitoring network, which consists of air quality monitoring stations at five locations (Figure 2):

1. The Berth 1 monitoring station is the only monitoring station within the premises boundary, located between the inactive Berth 1 and the tug pen. It is close to a number of sensitive receptors, including an overnight caravan park and the Geraldton foreshore area.
2. The Port Way monitoring station is located south of the premises, near the shed truck unloaders. It is approximately 350 m from the nearest residential receptor. The Licence Holder understands that measurements at this monitoring station are significantly influenced by dust sources outside of the premises, such as adjacent roads, as well as the neighbouring grain and fuel terminals.
3. The Lemmon Road monitoring station is located west of the premises, near the Berth 7 rail unloader and in between the Fishing Boat Harbour and Berth 5. The Licence Holder understands that measurements at this monitoring station are most impacted by potential dust emissions from Berth 3 and Berth 4, the port's rail operations and the open talc stockpile to the south.
4. The Connell Road monitoring station is located west of Berth 6 and the Fishing Boat Harbour. The monitoring station is located on a rockwall in close proximity to the ocean. The Licence Holder understands that measurements at this monitoring station are most likely impacted by Berth 6, as well as external dust sources, such as coastal sediments and sea salt aerosols.
5. The offsite monitoring station (not shown in Figure 2) is a beta attenuation monitor located at Bluff Point, approximately 4 km north of the premises, and acts as a regional/background monitoring station, to define any potential regional background concentrations away from the premises activities. This monitoring station is included in existing licence L4275/1982/15.

The air quality monitoring stations (aside from the BAM) is equipped with a tapered element oscillating microbalance (TEOM) capable of monitoring real-time PM₁₀⁴, a high-volume air sampler (Hi-Vol) to collect PM₁₀ samples for toxicant characterisation, as well as sensors for measuring wind, temperature, and humidity. A meteorological station (Tower 501) exists in between Berth 4 and Berth 5 to monitor wind direction and wind speed (Figure 2).

Based on a recent review of the existing air quality monitoring network (Ramboll 2023a), the Licence Holder has proposed to relocate the Berth 1 and Connell Road air quality monitoring stations for the following reasons (Figure 2):

⁴ PM₁₀ refers to particulate matter (PM) that is 10 micrometres or less in aerodynamic diameter.

- The Berth 1 air quality monitoring station is impacted primarily by grain loading and associated activities at Berth 3 and its surrounds (e.g., truck and rail unloading), which is outside of the Licence Holder’s operational control. Furthermore, the Port Maximisation Project (PMaxP) has highlighted the area surrounding the current monitoring station as an area for future development. The proposed location for the Berth 1 monitoring station is outside of the premises boundary, adjacent to the premises’ administration building, which is relatively close to its current location, while also improving monitoring of nearby sensitive receptors (e.g., overnight caravan park area, public use areas along the Geraldton foreshore).
- The Connell Road air quality monitoring station is impacted by numerous extraneous sources, such as adjacent boat building activity, sea spray, and beach sand. The monitor’s location on a rock wall makes it challenging for the Licence Holder to carry out rock wall repairs following storm events. Furthermore, the Fishing Boat Harbour Development Plan has highlighted the area surrounding the current monitoring station as an area for further development as a marine servicing and refuelling precinct. The proposed location for the Connell Road monitoring station is within the Tourist Precinct on the western side of the Fishing Boat Harbor.



Figure 2: Proposed air quality monitoring station locations

Key findings

The Delegated Officer has reviewed the information regarding the proposed relocation of the Berth 1 monitoring station in the amended licence and has found the following:

1. At the Berth 1 monitoring station, the prevailing wind directions have a high frequency of southerly winds. If moved to the proposed location, the monitoring station would be less likely to detect dust emissions from the premises, especially the adjacent

unregulated grain-handling facilities.

2. Consequently, while supportive of the relocation, the department indicated that the monitoring station be moved to the north-western end of the grassed area adjacent to the rail corridor, to better capture the southerly dominance of prevailing winds. This was subsequently accepted by the Licence Holder.
3. The Delegated Officer has updated Figure 4 of the amended licence to specify the current and proposed location for the Berth 1 monitoring station. The department recommends that, following future development works, the suitability of the new monitoring location be reviewed with respect to the relevant monitoring objectives.

The Delegated Officer has reviewed the information regarding the proposed relocation of the Connell Road monitoring station in the amended licence and has found the following:

4. For the Connell Road monitoring station, the prevailing wind directions have a high frequency of southerly winds. If moved to the proposed location, the monitoring station would be less likely to detect dust emissions from the premises that are in the current arc of influence. Therefore, the proposed location is not considered equivalent to the existing location.
5. In addition, the Licence Holder has indicated that measurements at the existing location are affected by accumulated beach sand. However, the department noted that the proposed location is also adjacent to a beach area.
6. Consequently, the department recommended directional and/or other relevant analyses be undertaken to demonstrate that exceedances are most likely caused by other dust sources (e.g., beach sand or boat building activities) prior to considering a relocation of the monitoring station. Based on current information, the Connell Road monitoring station should remain.
7. Subsequently, the Licence Holder proposed to install a new monitoring station at the proposed location, in addition to retaining the existing Connell Road monitoring station. As such, no changes have been made to the location of the Connell Road monitoring station in the amended licence. An assessment of the two monitoring locations will be made once sufficient monitoring information is available for statistical analysis and comparison. The Licence Holder anticipates that the current location for the Connell Road monitoring station will become surrounded by boat building industries over time.
8. The department accepts the approach that the Licence Holder has proposed to take and notes that at least one year of continuous monitoring data is recommended to capture potential seasonal meteorological variations. The additional monitoring station has not been conditioned in amended licence L4275/1982/15 until demonstrated to be an adequate replacement for the existing Connell Road monitoring station.

2.3.3 Addition of stormwater outfalls at Berth 7

Ground surface at a large portion of the premises is sealed by either asphalt, concrete, or compacted earthen hardstand, which produces a large volume of surface runoff during rainfall events. To manage stormwater runoff, the premises is equipped with an extensive stormwater drainage network, consisting of underground pipelines, spoon drains, and curbing, that disperses and removes surface water.

Stormwater from the drainage network discharges into the inner harbour through 17 stormwater outfalls at the premises (SW1 to SW17) (Figure 3). Existing licence L4275/1982/15 currently authorises the discharge of stormwater runoff from stormwater outfalls SW1 to SW15. The

outfalls associated with Berth 7 (SW16 and SW17) have not been specified in the existing licence. In this amendment, the Licence Holder seeks to amend the licence to reflect the stormwater outfalls present at Berth 7 as well. The department understands that these stormwater outfalls are already in operation.

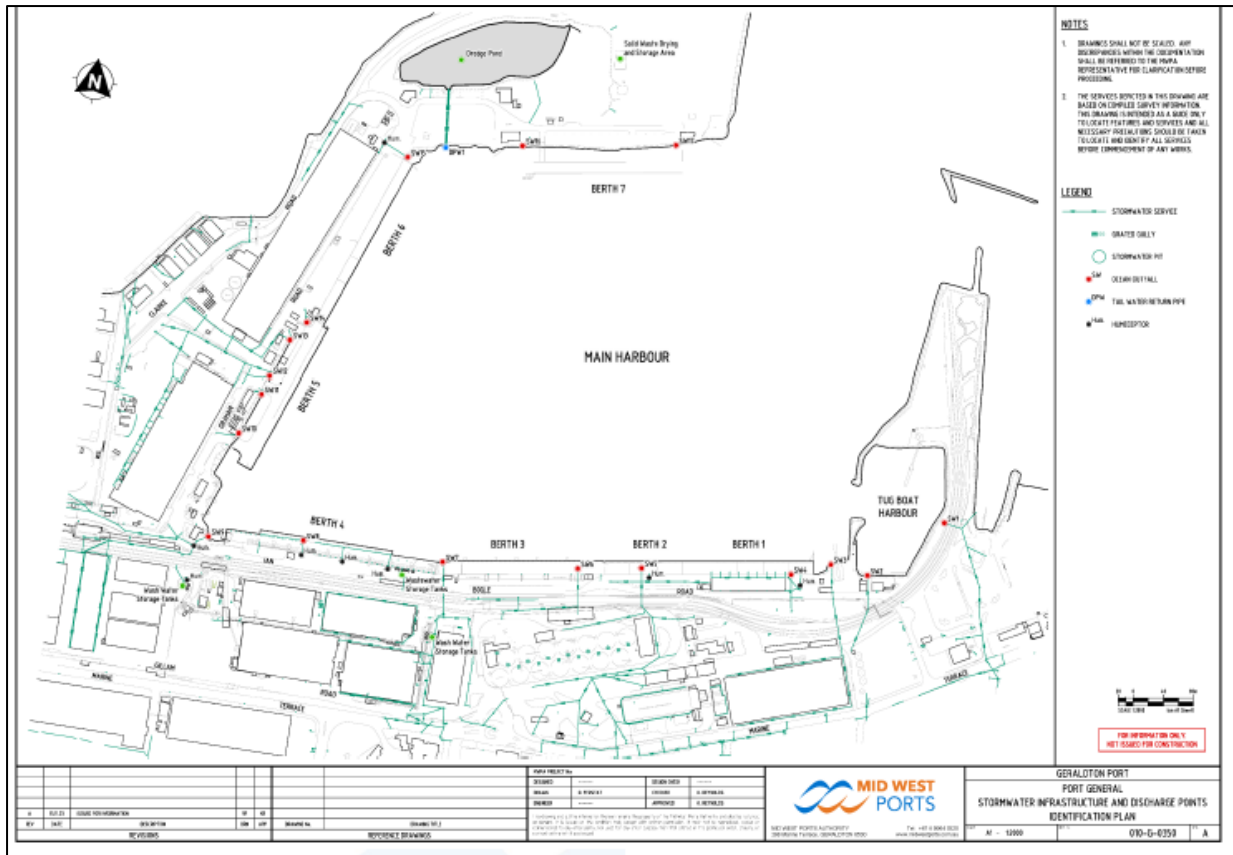


Figure 3: Stormwater management infrastructure at the premises

2.3.4 Discharge of treated washdown water at Berth 4

As part of the premises' housekeeping practices, material-handling infrastructure (e.g., common truck unloader, conveyors, and ship-loading equipment) are cleaned and washed down between product shipments to prevent cross-contamination of materials being handled. The washdown process may mobilise soluble residual products, chemicals, hydrocarbons, and/or sediments, which may enter the marine environment, if not properly managed.

Washdown water is primarily generated at Berth 4, which is equipped with a dedicated washdown bay for cleaning the ship loader⁵. Where non-hazardous materials are handled (e.g., clean fill, mineral sands, garnet, talc, etc.), washdown water drains into concrete-graded sumps and are treated through a HumeCeptor system⁶ prior to discharge through stormwater outfall

⁵ Other berths do not require dedicated washdown infrastructure as they are either cleaned using other methods (e.g., compressed air, vacuum truck), use specialised equipment (e.g., Rotainer box system), or only handle a single product (i.e., minimal risk of cross-contamination).

⁶ HumeCeptors are engineered gross pollutant traps, designed to remove coarse pollutants, sediments, and hydrocarbons from washdown water prior to being discharged into the harbour. The HumeCeptors are ineffective at treating specific contaminants, such as soluble metal concentrates.

SW8 into the inner harbour (Figure 3)⁷.

In addition, Berth 4 also contains a common-use truck unloader and conveyor system that directly feeds bulk materials to the ship loader. As the truck unloader only handles non-hazardous bulk materials, washdown water is captured in dedicated sumps and then transferred to settlement tanks (Figure 4). From the tanks, washdown water will be allowed to overflow into an infiltration basin. Where the infiltration basin does not have sufficient capacity, the excess water will flow through a HumeCeptor unit followed by two sediment traps prior to being discharged at stormwater outfall SW9. Sediments from the sumps and settlement tanks are collected and dried at the solid waste drying and storage facility at Berth 7 (refer to Section 2.3.6), prior to being disposed at a licensed landfill facility offsite.

As such, the Licence Holder requests that stormwater outfalls SW8 and SW9 be authorised to discharge treated water from low risk washdown activities. The department understands that the discharge of treated washdown water is already occurring at these stormwater outfalls.

⁷ Where more soluble and hazardous materials are handled (e.g., metal concentrates), the sump would be isolated to prevent discharge through the outfall. The washdown water would then be transferred (continued on next page) from the sump to storage tanks, and the potentially impacted sediments would be removed from the sumps via vacuum trucks. Both the washdown water and sediments are removed from the premises or managed by their third-party product owners. In this instance, there is no discharge of washdown water into the inner harbour marine environment.

That being said, during the 2023/2024 annual period, the Licence Holder has ceased handling of these materials at Berth 4 and transitioned towards metal concentrate handling at Berth 6 using Rotainer box systems. Lithium direct shipping ore and spodumene concentrate are still being handled at Berth 4, as authorised under an amendment to licence L4275/1982/15, dated 23 January 2024.

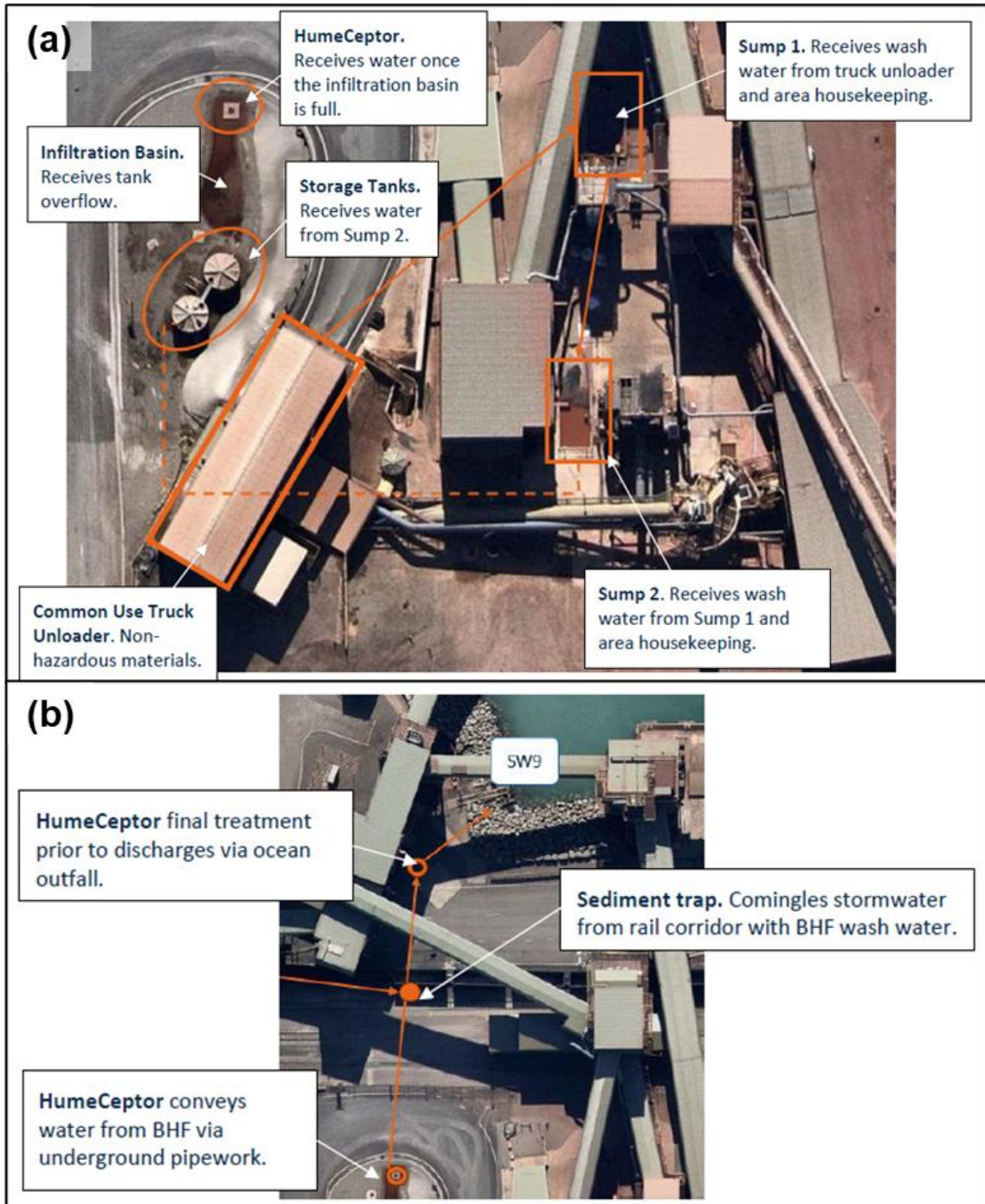


Figure 4: Washdown water management at the common user truck unloader at Berth 4

2.3.5 Passive water quality monitoring program

The Licence Holder has been undertaking marine water quality monitoring at the inner harbour since 2012. The Licence Holder has employed diffusive gradient in thin films (DGT) samplers, which passively sample ionic trace metals over time. The samplers are then analysed to derive a time-weighted average concentration for a suite of metal parameters⁸.

The purpose of the monitoring program was to understand whether metal contaminants were

⁸ Analytical suite currently consists of cadmium, copper, cobalt, lead, nickel, and zinc.

soluble and bioavailable to environmental receptors within the inner harbour marine environment. This method is thought to provide more representative monitoring data compared to conventional grab sampling, as the former is more likely to reflect mixing and dilution that occurs within the harbour.

Currently, the monitoring program monitors passive water quality at up to five locations (i.e., four locations around berths and stormwater outfalls, and one location acting as a reference site) (Figure 5). Historically, monitoring was primarily undertaken on a bi-monthly basis, but have shifted to a monthly basis since 2023, which would reduce averaging time and provide higher resolution data for identifying trends relating to specific events.

The Licence Holder seeks to include the existing passive water quality monitoring program in the amended licence.

Key findings

The Delegated Officer has reviewed the information regarding the proposed inclusion of the passive water quality monitoring program in the amended licence and has found the following:

1. The methodology for the passive water quality monitoring program is detailed in the Passive Water Quality Monitoring Sampling and Analysis Plan (PWQMSAP). However, the department considers that the PWQMSAP does not provide adequate detail on several aspects of the monitoring program, including (but not limited to) the calculations that are applied to derive the reported time-weighted average concentrations from the passive samplers, the laboratory undertaking the analysis (if known), and the relevant National Association of Testing Authorities (NATA) accreditation and how these concentrations can be applicable to the default guideline values. The PWQMSAP should provide justification as to why the assumptions, coefficients, deployment time, analytical parameters, and other aspect of the methodology are site-specific and/or applicable to the premises (i.e., fit for purpose). The methodology provided to date appears generic and did not provide sufficient site-specific context, which lowered the confidence in the methodology.
2. The department considers the current reference site for passive water quality monitoring (PWSR) to be inappropriate, in accordance with the specifications outlined in EPA WA (2016), as it is only approximately 300 m from the inner harbour entrance and may be impacted by activities at the premises. The department understands that it is challenging to install a passive water sampler further away from the harbour in Champion Bay due to the fragile nature of the sampler component, as well as the lack of fixed infrastructure on which to attach the sampler to. Nevertheless, the department recommends the Licence Holder seek an alternative monitoring location that is fit for purpose, and that this be reflected in the PWQMSAP. When selecting appropriate unimpacted reference sites, care must be given to ensure they are both representative of the impact sites but located well away from the actual zone of influence.
3. While the department supports the use of passive water quality samplers to better understand contaminant bioavailability in marine environments, passive water sampling is typically used to complement, not replace, conventional grab sampling. Both sampling methodologies should be employed and integrated using a tiered, decision tree approach, in accordance with the ANZG (2018). The department understands that a grab water sampling program was initiated in June 2024 (Figure 5), though there is still inadequate information to assess the adequacy of the program.
4. The potential impact to the marine environment is currently being assessed by an ongoing ambient sediment quality monitoring program, as required by existing licence L4275/1982/15. Given the risk assessment of the potential impact on marine environment (refer to Section 3.5), the monitoring of marine water quality is not

considered essential, though it may be complementary to the sediment monitoring program.

5. Noting there are still uncertainties with both the grab water sampling program and passive water quality monitoring program, the Delegated Officer has decided to include the passive water quality monitoring program in the amended licence L4275/1982/15, as well as the conventional marine water quality monitoring program (refer to Section 3.5.6). However, monitoring location PWSR was not included in the amended licence, as the department does not consider it an appropriate unimpacted reference site.
6. As the department is not currently confident on the methodology and the applicability of the monitoring information to default guideline values outlined by ANZG (2018), no target or limit has been specified for the marine water monitoring programs at this point in time in the amended licence.
7. The Licence Holder is encouraged to further refine both monitoring programs, as reflected in the relevant sampling and analysis plans, which will be reviewed by the department in the future. Where required, the department may include additional regulatory controls in licence L4275/1982/15 to achieve adequate monitoring outcomes at a later stage.

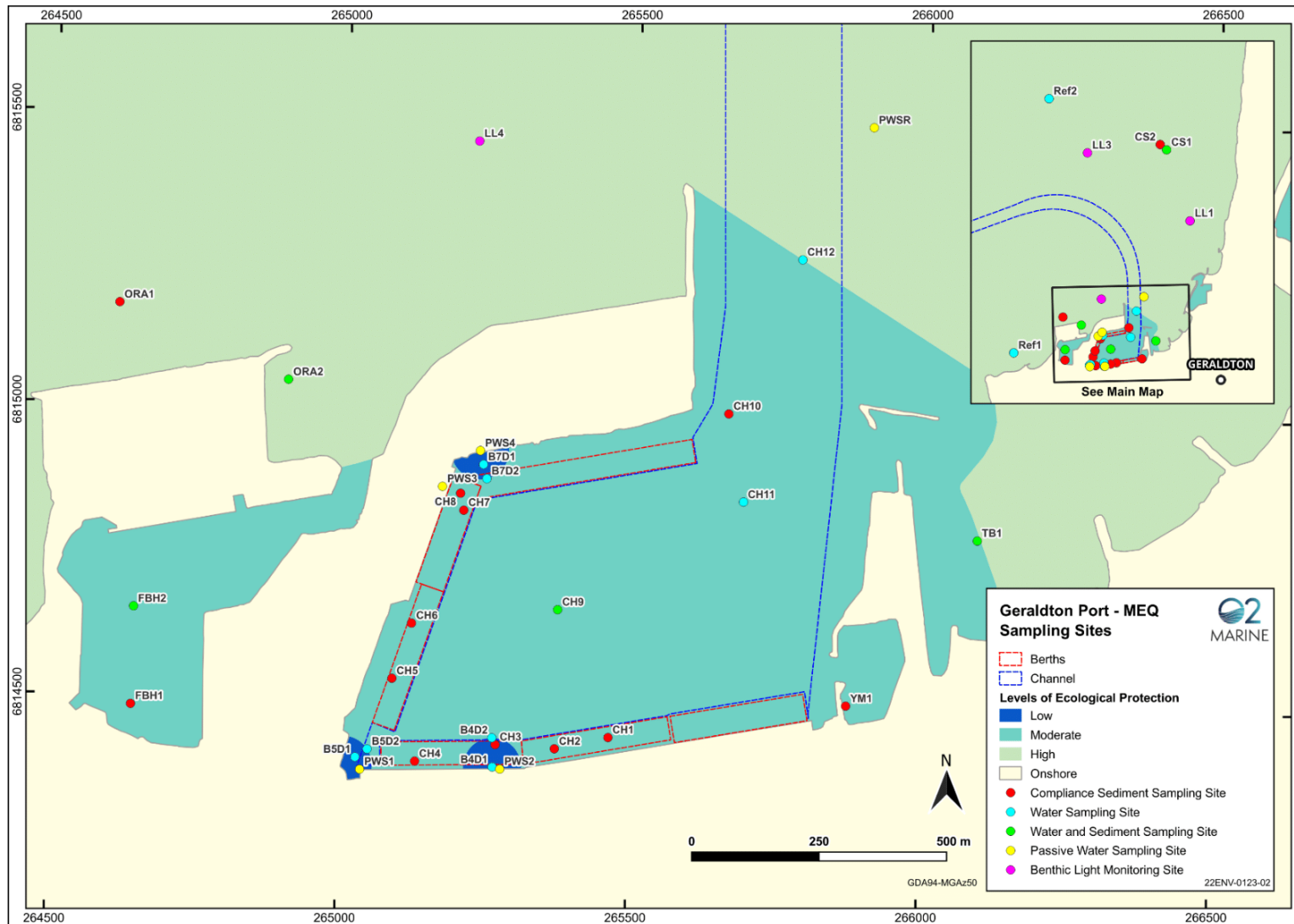


Figure 5: Passive water sampling and conventional grab sampling monitoring locations

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2.3.6 Dredge pond and solid waste drying and storage facility at Berth 7

In addition to ship-loading activities, Berth 7 also contains a dredge pond for storing dredge spoils (Figure 6). A tail water return pipeline (DPW1) connects the dredge pond to the inner harbour, allowing for exchange of sea water and preventing pond stagnation between dredging programs. To the east of the dredge pond is the operational solid waste drying and storage areas (Figure 6), which accepts sediments from sumps throughout the premises for drying and storage prior to offsite disposal. The department understands that these facilities and infrastructure are already operational.

It is understood that Berth 7 is reclaimed land along the existing northern breakwater, which was assessed under Part IV of the EP Act and approved under Ministerial Statement (MS) No. 600, as part of the Geraldton Port Enhancement Project. The reclamation area has been progressively filled with contaminated and potentially contaminated sediments from the inner harbour during capital and maintenance dredging campaigns and is expected to reach capacity within the next three to five years of planned maintenance dredging.

Key findings

The Delegated Officer has reviewed the information regarding the proposed inclusion of the tail water return pipeline DWP1 and the solid waste drying and storage facility in the amended licence and has found the following:

1. It is understood that capital dredging projects have previously been referred to and assessed by the Environmental Protection Authority Western Australia (EPA WA) under Part IV of the EP Act (refer to Section 2.5).
2. Furthermore, it is understood that the premises was reported to the department under the *Contaminated Sites Act 2003*, with a voluntary auditors report submitted in 2021. One aspect of the premises that was investigated was the dilution of leachate from the reclamation area and circulation within the harbour.
3. The Delegated Officer notes that dredging and other activities associated with land reclamation do not fall under the description of Category 58 and 58A, as shown in Schedule 1 of the *Environmental Protection Regulations 1987*. As such, the Delegated Officer has decided not to include the tail water return line in amended licence L4275/1982/15. This amendment has not assessed the potential risk of emissions and discharges associated with the pipeline.
4. Management of the dredging, the dredge pond and associated tail water return pipeline can be managed under Part IV of the EP Act (should there be a significant proposal in the future), the *Contaminated Sites Act 2003*, and under the general provisions of the EP Act.
5. As it is associated with management of stormwater and washdown water generated from bulk material handling activities at the premises, the Delegated Officer has assessed the potential risks associated with emissions and discharge of the operation of the solid waste drying and storage facility.



Figure 6: Location of dredge pond, tail water return pipe, and solid waste drying and storage area at Berth 7

2.4 CEO-initiated amendment

Existing licence L4275/1982/15 is active until 17 March 2025. The Delegated Officer has amended the expiry date from 17 March to 11 March, to align the duration and expiry of the licence with its annual fee period.

Furthermore, the Delegated Officer has extended the duration of licence L4275/1982/15 by a period of approximately 10 years, until 11 March 2035. The Licence Holder was notified of this proposed amendment on 27 September 2024 .

2.5 Complaints summary

In this assessment, the department will also consider complaints received by the Licence Holder, where relevant to the scope of the amendment. The recording of complaints is required under existing licence L4275/1982/15, which are communicated to the department through the submission of the Annual Audit Compliance Report and Annual Environmental Report.

Historically, the Licence Holder has received on average less than four complaints annually. However, over the last five years, an increasing number of complaints have been received. A summary of the complaints received in the past six years of annual reporting is summarised in

Table 2.

Table 2: Summary of complaints from 2018 to 2023

Annual period	Total number of complaints	Number of complaints relating to:			Description of complaints
		Dust	Noise	Others	
2023/2024	16	11	3	2	Dust complaints related to iron ore, red and black dust, white talc dust. Most dust complaints were made in relation to the neighbouring Fishing Boat Harbour. Noise complaints related to truck movements along John Wilcock Link.
2022/2023	17	15	2	0	Dust complaints related to iron ore, red and black dust, grain dust, white talc dust. Most dust complaints were made in relation to the neighbouring Fishing Boat Harbour. Noise complaints related to noise generated from dust monitoring station and rail corridor.
2021/2022	42	41	1	0	Dust complaints related to iron ore red/pink dust, grain dust, and white talc dust. Most dust complaints were made in relation to the neighbouring Fishing Boat Harbour. Noise complaint related to operation of grain silos at the premises.
2020/2021	8	6	2	0	Dust complaints related to red and pink dust from the premises. Dust complaints were made in relation to the neighbouring Fishing Boat Harbour. Noise complaints related to premises operation, including rail corridor.
2019/2020	6	3	0	3	Dust complaints related to grain handling and dust from rail corridor. Other complaints related to sand lift-off from nearby Pages Beach and other sand-disturbing activities, as well as plastic pollution.
2018/2019	6	4	0	2	Dust complaints related iron ore dust, black dust, dust from rail corridor. Other complaints related to sand lift-off from nearby Pages Beach and other sand-disturbing activities.

Most of the complaints were made by users of the Fishing Boat Harbour (FBH), which abuts the western boundary of the premises. It is understood that the Fishing Boat Harbour is leased to third-party personal and commercial users. The complaints from the leaseholders relate to fugitive dust emissions from the operation of the premises, specifically dust from iron ore handling, which has been described as 'black', 'red', and 'pink', as well as dust from talc stockpiling and handling, which has been described as 'white'. Based on the complaints, fugitive dust emissions from the premises have resulted in a loss of amenity, as well as deposited dust on vessels and nearby infrastructure, subsequently requiring frequent washing down and

maintenance works on the vessel.

The most complaints were received by the Licence Holder during the 2021/2022 annual period, where up to 42 complaints were received – of which 41 of them were related to dust emissions and 38 of them were from the Fishing Boat Harbour. In response to this, the Licence Holder has mandated port-specific dust management plans for third-party operators within the premises, which must align with the Licence Holder's overarching Dust Management Plan (DMP). The need for adequate product moisture conditioning, as well as the maintenance and management of dust extraction and suppression system, are the key focus areas for the Licence Holder. This is further discussed in Section 3.4.

The complaints detailed in Table 2 are consistent with comments received as a result of public advertising of this application (refer to Appendix 1), namely relating to:

1. Ongoing dust issues, including black dust and pink dust, depositing on surrounding cars, houses, residential properties, roads, rainwater tanks, birdlife, and to the wider township as a whole, resulting in a loss of amenity;
2. Concerns about long-term health impacts of continued exposure to fugitive dust emissions from the premises, especially with regard to the toxicity of iron ore dust and talc dust;
3. Impacts to leaseholders at Fishing Boat Harbour, which, despite engagement from the Licence Holder, have not been resolved, resulting in the need for continuous washing down, frequent maintenance works due to vessel damage and corrosion (e.g., oxidation and staining);
4. Requirement for further monitoring, reporting, and publishing of ambient dust concentrations by independent third-party.

The Licence Holder was provided the opportunity to address these comments directly, which are also detailed in Appendix 1.

Finally, under condition 35 of existing licence L4275/1982/15, the Licence Holder is required to not only record information on complaints received, but also the complete details and dates of any actions taken to investigate or respond to the complaints. This information was provided in the Licence Holder's Annual Environmental Report up to the 2020/2021 annual period but have ceased since the 2021/2022 annual period (i.e., when there was a spike in dust-related complaints). The Delegated Officer brings this to the attention of the Licence Holder, as the provision of information relating to investigations and actions taken in response to complaints received is a condition of existing (and amended) licence L4275/1982/15 and should be provided in the Annual Environmental Report. Information on actions taken allows the department to better assess the risk of impact, where required.

2.6 Part IV of the EP Act

While the scope of the proposed amendment has not been referred to the Environmental Protection Authority of Western Australia (EPA) for assessment under Part IV of the EP Act, the premises and its various expansion projects have previously been assessed by the EPA and subject to Ministerial Statements. These are summarised in Table 3.

The scope of this amendment was not referred to the EPA, as it was not considered a 'significant proposal'. That being said, the department understands that other, more significant components of the PMaxP will be referred to the EPA under Part IV of the EP Act for assessment.

Table 3: Existing assessments and approvals under Part IV of the EP Act

Ministerial statement	Date of approval	Associated EPA report	Proposal description
MS 87	27 December 1989	411	<p>Proposal related to reclamation of 5 hectare (ha) area within the inner harbour. Associated works included breaching of outer breakwater and dredging of channel to create new entrance to fishing boat harbour. Spoils from maintenance dredging used as fill for proposed reclamation.</p> <p>Key environmental factors assessed included water quality, marine ecosystems, offshore coastal processes, as well as noise and dust impacts.</p> <p>MS 87 was approved, subject to conditions relating to protection of water quality within the inner harbour, management of dredging activities and resultant sediment plumes, management of hydrocarbon as well as stormwater drainage and discharge into the marine environment, etc.</p>
MS 367	5 October 1994	752	<p>Proposal related to further expansion of port facilities, with extension of sand trap breakwater and reclamation of 7.8 ha by trapping littoral drift on the ocean side of the fishing boat harbour. The proposal would enable sand to accumulate in a manner that reduced the cost of land reclamation for further port development.</p> <p>Key environmental factors assessed included water quality, protection of biological communities, and shoreline stability.</p> <p>MS 367 was approved, subject to conditions relating to protection of water quality within the inner harbour, management of dredging activities and resultant sediment plumes, and monitoring of shoreline stability, etc.</p>
MS 600	10 June 2022	1050	<p>Proposal to implement the Port Enhancement Project and undertake preparatory works for the Town Beach Foreshore Redevelopment Project, including deepening of harbour basin by dredging, widening of existing channel and extension of channel out to sea, disposal of dredge spoil from channel dredging offshore to create artificial lobster catching reefs, modifications to breakwater design, and construction of railway line on eastern breakwater.</p> <p>Key environmental factors assessed included benthic primary producer habitat, water quality, marine mammals, noise impacts, visual impact, and coastal stability.</p> <p>MS 600 was approved, subject to conditions relating to management and monitoring of marine environment and its associated values.</p>

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020b).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 4. Table 4 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 4: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Dust	<p>Handling of bulk material at port facility at maximum annual throughput of 23,000,000 tonnes and maximum daily throughput of 160,000 tonnes, including loading, unloading, conveyor transfer, stockpiling, and storage; and</p> <p>Operation of berthing stations, unloader facilities, storage sheds, stormwater drainage network, solid waste drying and storage facility at maximum annual throughput of 23,000,000 tonnes and maximum daily throughput of 160,000 tonnes.</p>	Air/ windborne pathway	<p>The following controls are currently being implemented at the premises:</p> <ul style="list-style-type: none"> • Implementation of a Dust Management Plan (DMP), which outlines objectives, management actions, monitoring programs, trigger levels and corrective actions for management of dust emissions (refer to Table 12). • Requirement for leaseholders and third-party operators at the premises to develop site-specific DMP that aligns and meets the objectives of the Licence Holder's DMP, including adequate use of dust extraction and suppression systems, product moisture conditioning, and product handling procedures. • Requirement for leaseholders and third-party operators to provide pre-shipment form of each shipment, which includes the moisture content of the bulk material and the relevant dust extinction moisture (DEM) level. The form must be reviewed and approved by the Licence Holder prior to ship-loading activities. • Establishment of a Dust Steering Committee to initiate and oversee series of dust improvement programs at the premises, with upgrades made to dust extraction and suppression system, improvements to operational and material handling practices (refer to Table 13). • Dedicated storage sheds are associated with each berth and bulk material being handled (Figure 1), except for talc, which is present as an open stockpile. A DustTamer fence has been installed to manage fugitive dust emissions from the talc stockpile area, with validation dust monitoring undertaken. • Targets are applied for bulk material moisture conditioning (i.e., to meet dust extinction moisture level), as well as wind speed and wind direction limits for iron concentrate loading. • Berths and operational areas are routinely inspected and mechanically swept to detect and remove potential spillage of bulk material. Inspections are also aimed at identifying excessive fugitive dust emissions, as well as the efficacy of third-party operators' dust management practices. • Ambient dust and air quality monitoring program being implemented around the premises using fixed and portable dust monitors, as well as a dust deposition monitoring program being implemented around Fishing Boat Harbour.

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> • Based on the findings of a dust impact assessment (Ramboll 2023b), a temporary dust monitor will be installed west of the premises to undertake validation monitoring. <p>Existing licence L4275/1982/15 also requires the following for the management of dust emissions:</p> <ul style="list-style-type: none"> • Condition 3 – Ensuring that dust filtration system is operational in all storage sheds where iron ore and metal concentrate are being stored and handled, when dust-generating activities are being undertaken. • Condition 8 – Operational requirements for dust management from the handling of regulated bulk material. • Condition 9 and 10 to 14 – Operational requirements for the handling of manganese ore, including requirements for moisture conditioning and recordkeeping. • Condition 24 – Requirement to implement reasonable and practicable measures to ensure dust emissions do not cross the premises boundary. • Condition 30 – Monitoring requirements at four fixed monitoring locations around the premises for PM₁₀, copper, manganese, nickel, lead, and lithium, including specified targets.
Noise		Air/ windborne pathway	<ul style="list-style-type: none"> • Elevated noise-generating equipment are shielded and insulated for noise attenuation. • Routine balancing and maintenance of dust extraction systems will be undertaken to minimise risk of excessive noise generation during operations. • A noise impact assessment was undertaken to demonstrate that compliance with the <i>Environmental Protection (Noise) Regulations 1997</i> is achievable given the proposed increase in throughput capacity to 23,000,000 tonnes per annual period. • Improvements to equipment and infrastructure will be undertaken in consultation and collaboration with third-party berth operators, in accordance with recommends from a recent noise impact assessment (AES 2023) (refer to Section 3.3.3). • Validation noise monitoring will be undertaken to verify predictions in the noise impact assessment (refer to Section 3.3.3). • Occupational noise surveys will be undertaken on a five yearly basis, which may inform risk of noise impacts to other human receptors. • Implementation of existing Noise Management Plan, which outlines a series of improvement actions to achieve an overall reduction in noise emissions from shiploaders and dust extraction systems (refer to Section 3.3.3). Works completed to date include integrity assessment of Berth 4 dust extraction

Emission	Sources	Potential pathways	Proposed controls
			<p>systems, followed by decommissioning and replacement of existing dust collectors with quieter dry fogging units.</p> <ul style="list-style-type: none"> As part of the Fishing Boat Harbour development plan, the Licence Holder is also investigating the installation of an acoustic barrier along Ian Bogle Road to reduce noise emissions received at the Fishing Boat Harbour. <p>Existing licence L4275/1982/15 does not contain any conditions directly relating to noise emissions.</p>
Bulk material		Loss of containment during loading and/or unloading, resulting in direct discharge to marine environment	<p>The following controls are currently being implemented at the premises:</p> <ul style="list-style-type: none"> Stormwater drainage network consists of kibbles, sumps, and HumeCeptor systems to treat stormwater for coarse particulates and hydrocarbon prior to being discharged via stormwater outfalls. Berths and operational areas are routinely inspected and mechanically swept to detect and remove potential spillage of bulk material. Inspections are also aimed at identifying any potential spillages, as well as the efficacy of third-party operators' material handling and shiploading practices.
Contaminated stormwater		Direct discharge to marine environment from stormwater outfalls (SW01 to SW17) and potentially overland runoff during rainfall events	<ul style="list-style-type: none"> Washdown activities are undertaken in accordance with relevant washdown procedures, with washdown water captured in designated sumps and tanks. Sumps, sediment pits, and pollutant traps are routinely inspected and cleaned. Spill deflector plates will be utilised during bulk material unloading events. Retainer box system will be utilised for loading of metal concentrate (including iron concentrate, manganese ore) and mineral sand concentrate onto vessels via a dedicated berth (Berth 6) Adequate moisture conditioning must be undertaken to meet the dust extinction moisture level for each type of bulk material handled. Targets are applied for bulk material moisture conditioning (i.e., to meet dust extinction moisture level), as well as wind speed and wind direction limits for iron concentrate loading. Ambient sediment quality monitoring program, sediment pore water monitoring program, ambient marine water monitoring program, as well as opportunities stormwater monitoring program are being implemented. <p>Existing licence L4275/1982/15 also requires the following for the management of potential loss of containment and contamination of stormwater runoff:</p> <ul style="list-style-type: none"> Condition 2 – Requirement to implement practical measures to prevent the contamination of stormwater runoff.

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> • Condition 5 to 7 – Requirements for spillages to be recovered and removed from the premises to prevent their release into the marine environment, and for measures to be taken to prevent spillage from occurring via the gap between the berth and vessel during loading and unloading events. • Condition 8 – Operational requirements for dust management from the handling of regulated bulk material. • Condition 9 and 10 – Operational requirements for the handling of manganese ore, including requirements for material handling and mechanical sweeping post-shipment event. • Condition 23 – Authorisation to discharge only stormwater runoff from stormwater outfalls SW1 to SW15 into the Geraldton Harbour. • Condition 31 – Monitoring requirements for ambient sediment and pore water quality within the inner harbour and surrounding the premises, including specified limits. • Condition 33 – Monitoring requirements for total nitrogen and ammonia at Berth 6 stormwater outfall during fertiliser handling events. • Condition 34 – Monitoring requirements for total iron at Berth 6 during iron concentrate handling events.
Treated washdown water		Direct discharge to marine environment from stormwater outfalls (SW08 and SW09)	<p>The following controls are currently being implemented at the premises:</p> <ul style="list-style-type: none"> • Washdown activities are undertaken in accordance with relevant washdown procedures, with washdown water captured in designated sumps and tanks. • Washdown water from Berth 4 will not be from handling of metal concentrates, which have been moved to Berth 6 (except lithium direct shipping ore and spodumene concentrate) and handled using Rotainer box system. The primary bulk material handled at Berth 4 are chemically benign. • Washdown water will be stored in sumps to allow for suspended sediments to settle, before being sent to an infiltration basin, with only the excess water being sent to be discharged via stormwater outfalls SW08 and SW09. Prior to discharge, washdown water is treated through two HumeCeptor systems and a sediment trap (refer to Section 2.3.4). • Sumps, sediment pits, and pollutant traps are routinely cleaned. • Wastewater generated from washdown of hazardous bulk material (e.g., metal concentrate) are not discharged into the marine environment. Instead, the sumps are isolated and the washdown water is collected and either disposed or returned to the relevant third-party operator (refer to Section 2.3.4). • Ambient sediment quality monitoring program, sediment pore water monitoring program, ambient marine water monitoring program, as well as

Emission	Sources	Potential pathways	Proposed controls
			<p>opportunities stormwater monitoring program are being implemented.</p> <ul style="list-style-type: none"> Where appropriate, washdown water is reused for dust suppression within storage sheds, reducing the amount of washdown water for discharge. A common truck unloader facility will be constructed to replace the existing facility, with automated washdown water recycling capabilities, which will further reduce the amount of washdown water generated for discharge. <p>Existing licence L4275/1982/15 also requires the following for the management of treated washdown water discharge.</p> <ul style="list-style-type: none"> Condition 8 – Operational requirements for dust management from the handling of regulated bulk material. Condition 4 and 15 to 22 – Requirements for undertake trial of new bulk material handling at the premises, including requirement to undertake a risk assessment for potential emission and their potential impact on the marine environment. Condition 31 – Monitoring requirements for ambient sediment and pore water quality within the inner harbour and surrounding the premises, including specified limits.
Solid waste leachate		Overland runoff during rainfall events, resulting in direct discharge to marine environment	<p>The following controls are currently being implemented at the premises:</p> <ul style="list-style-type: none"> Solid waste drying is undertaken within a designated concrete pad area within the Berth 7 reclamation area, which is partially lined. Excess water from the drying bay drains into a two-stage infiltration sump at the Berth 7 reclamation area, while stormwater within the Berth 7 reclamation area drains towards the dredge pond. Dried sediment waste is tested in accordance with the <i>Landfill Waste Classification and Waste Definitions 1996 (as amended 2019)</i> prior to disposal at an appropriately licensed offsite waste facility. <p>Existing licence L4275/1982/15 also requires the following for the management of solid waste leachate:</p> <ul style="list-style-type: none"> Condition 2 – Requirement to implement practical measures to prevent the contamination of stormwater runoff. Condition 31 – Monitoring requirements for ambient sediment and pore water quality within the inner harbour and surrounding the premises, including specified limits.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020b), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment.

Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 5 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020a)).

Table 5: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed premises boundary
Residential premises	<p>The premises is located within the Geraldton township, where a number of residential premises are located in the vicinity of the premises boundary (Figure 7), including:</p> <ul style="list-style-type: none"> • Dwelling (R3) – 250 m south; • Dwelling (R4) – 350 m east; • Dwelling (R7) – 410 south-east; and • Dwelling (R1) – 530 south-west. <p>Additionally, other types of short-term dwellings are also present nearby, including:</p> <ul style="list-style-type: none"> • Caravan park (R2) – 330 m south-west; and • Short-term overnight caravan park (R10) – Adjacent to the eastern most portion of the premises boundary.
Sensitive premises	<p>In addition to premises for long- and short-term residential uses, the following premises are considered sensitive (Figure 7):</p> <ul style="list-style-type: none"> • Retirement village (R5) – 230 m south-east; and • Primary school (Primary School/Public Purpose) – 520 m south-east.
Commercial and industrial premises	<p>The premises is surrounded and abuts various industrial and commercial premises, particularly along the south-east portion of the premises (R6 and R8) (Figure 7). Of note, however, is the Fishing Boat Harbour (R11) abutting the north-west corner of the premises boundary, which is leased by third-party commercial and recreational users.</p>
Recreational premises	<p>A number of public open spaces are located south and south-east of the premises, most notably the Geraldton Foreshore and Geraldton Beach (R9) are located approximately 100 m east of the premises boundary (Figure 7).</p>
Environmental receptors	Distance from prescribed activity
Terrestrial environment	<p>Based on aerial imagery, there are patches of vegetation between the built environment, located to the east, south, and west of the premises. Coastal dune vegetation is present along the foreshore to the east and west of the premises. Furthermore, historical records and public submissions have indicated a number of avifauna sighting around the premises.</p>
Marine environment	<p>The north of the premises abuts the inner harbour which opens into the Champion Bay and the wider Indian Ocean. Marine water quality along Champion Bay is considered to be very high, whilst the marine sediments are considered to be of natural origin and mostly unimpacted. The local benthic communities and habitats are highly diverse and comprises mixed seagrass communities, mixed seagrass, and macroalgal communities, low to high relief limestone reefs, and mobile sand sheets overlying limestone pavements.</p> <p>The inner harbour marine environment is considered less pristine due to historical and continued anthropogenic activities associated with dredging, land reclamation, and shipping industries. In contrast to the wider Champion Bay, the Licence Holder considers the inner harbour to be moderately disturbed, with</p>

Human receptors	Distance from prescribed premises boundary
	disturbance thought to be greatest along the berths, where the stormwater outfalls are located (Figure 5).
Marine fauna	<p>A number of marine fauna species have been sighted around the premises and its surrounds, likely along Champion Bay and further offshore, including Australian sea lions, humpback whales, Indo-Pacific bottlenose dolphin, and the Western rock lobsters.</p> <p>In particular, the Australian sea lions (<i>Neophoca cinerea</i>) are listed as an endangered marine species under the <i>Environmental Protection and Biodiversity Conservation Act 1999 (Cth)</i> and <i>Biodiversity Conservation Act 2016 (WA)</i> and have been known to utilise the rock walls beneath and adjacent to the berths for hauling out, while also foraging for food in nearby waters.</p>

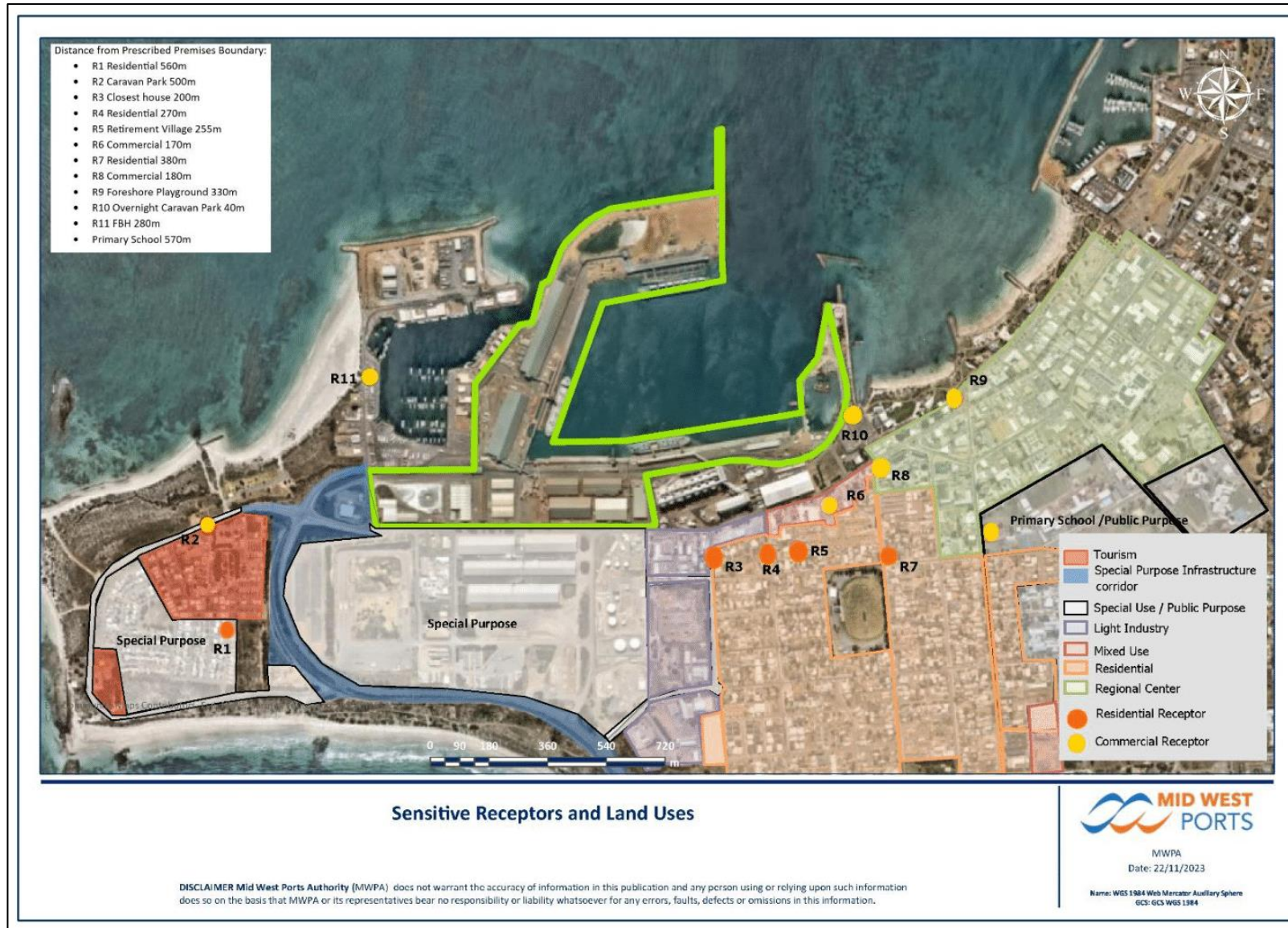


Figure 7: Sensitive human receptors nearby the premises

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3.2 Risk ratings

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

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 6.

The amended licence L4275/1982/15 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER, 2015).

Table 6. Risk assessment of potential emissions and discharges from the premises operation

Risk Event					Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls	
Source/ Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls	C = consequence L = likelihood				
<p>Handling of bulk material at port facility at maximum annual throughput of 23,000,000 tonnes and maximum daily throughput of 160,000 tonnes, including loading, unloading, conveyor transfer, stockpiling, and storage;</p> <p>Operation of berthing stations, unloader facilities, storage sheds, stormwater drainage network, solid waste drying and storage facility at maximum annual throughput of 23,000,000 tonnes and maximum daily throughput of 160,000 tonnes.</p>	Dust (including PM ₁₀ containing metal and metalloids)	<p>Pathway: Air / windborne pathway</p> <p>Impact: Impact to human health through inhalation and dermal contact</p>	<p>Residential premises</p> <p>Sensitive premises</p> <p>Commercial and industrial premises</p> <p>Recreational premises</p>	Refer to Section 3.1	<p>C = Moderate</p> <p>L = Unlikely</p> <p>Medium risk</p> <p>Refer to Section 3.4.</p>	Y	<p>Condition 1 – Maintenance of pollution control and monitoring equipment</p> <p>Condition 3 – Maintenance of dust extraction system</p> <p>Condition 4 – Requirement for adequate moisture conditioning of bulk material</p> <p>Condition 5 – Dust mitigation requirements during shiploading and unloading</p>	Refer to Section 3.4.	
	Dust (TSP)	<p>Pathway: Air / windborne pathway</p> <p>Impact: Impact to amenity through deposition</p>	<p>Commercial and industrial premises</p> <p>Residential premises</p> <p>Sensitive premises</p> <p>Recreational premises</p>	Refer to Section 3.1	<p>C = Moderate</p> <p>L = Possible</p> <p>Medium risk</p> <p>Refer to Section 3.4.</p>	Y		<p>Condition 9 – Premises operational requirements</p> <p>Condition 10 – Infrastructure and equipment operational requirements</p> <p>Condition 21 – Dust emission requirements</p> <p>Condition 27 – Ambient air quality monitoring requirements</p>	Refer to Section 3.4.
	Dust (TSP)	<p>Pathway: Air / windborne pathway</p> <p>Impact: Impact to terrestrial and marine environment and their ecological health</p>	<p>Terrestrial environment</p> <p>Marine environment</p> <p>Marine fauna</p>	Refer to Section 3.1	<p>C = Moderate</p> <p>L = Possible</p> <p>Medium risk</p>	Y		<p>The Delegated Officer has determined the proposed controls for managing the potential impact of dust emissions from the premises' operation on environmental receptors to be adequate.</p> <p>Controls proposed and implemented to manage dust impacts on human health and amenity receptors (detailed in Section 3.4.4) are also applicable to this risk event and have been considered in determining this risk rating.</p> <p>No additional regulatory controls are required.</p>	
	Noise	<p>Pathway: Air / windborne pathway</p> <p>Impact: Impact to amenity</p>	<p>Residential premises</p> <p>Sensitive premises</p> <p>Commercial and industrial premises</p>	Refer to Section 3.1	<p>C = Moderate</p> <p>L = Unlikely</p> <p>Medium risk</p> <p>Refer to Section 3.3.</p>	Y	None.	Refer to Section 3.3.	
	Bulk material	<p>Pathway: Loss of containment during loading and/or unloading, resulting in direct discharge to marine environment</p> <p>Impact: Impact to marine environment and ecological health</p>	<p>Marine environment</p> <p>Marine fauna</p>	Refer to Section 3.1	<p>C = Minor</p> <p>L = Unlikely</p> <p>Medium risk</p> <p>Refer to Section 3.5.</p>	Y	<p>Condition 6 – Requirement to remove spillage on vessel deck</p> <p>Condition 7 – Requirement to remove spillage within the premises</p> <p>Condition 8 – Requirement to prevent spillage via gap between berth and vessel</p> <p>Condition 9 – Premises operational requirements</p> <p>Condition 28 – Ambient sediment and pore water monitoring requirements</p> <p>Condition 29 – Ambient marine water quality monitoring requirements</p>	Refer to Section 3.5.	
	Contaminated stormwater (including metal, metalloids, and/or	<p>Pathway: Direct discharge to marine environment from stormwater outfalls (SW01 to SW17) and</p>			Refer to Section 3.1	<p>C = Minor</p> <p>L = Unlikely</p> <p>Medium risk</p>	Y	<p>Condition 2 – Stormwater management</p> <p>Condition 7 – Requirement to remove spillage within the premises</p>	Refer to Section 3.5.

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/ Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
	sediments)	potentially overland runoff during rainfall events Impact: Impact to marine environment and ecological health			Refer to Section 3.5.		Condition 9 – Premises operational requirements Condition 20 – Requirements for authorised emission points Condition 28 – Ambient sediment and pore water monitoring requirements Condition 29 – Ambient marine water quality monitoring requirements Condition 30 – Stormwater emission monitoring requirements	
	Treated washdown water	Pathway: Direct discharge to marine environment from stormwater outfalls (SW08 to SW09) Impact: Impact to marine environment and ecological health		Refer to Section 3.1	C = Minor L = Unlikely Medium risk Refer to Section 3.5.	Y	Condition 9 – Premises operational requirements Condition 10 – Infrastructure and equipment operational requirements Condition 28 – Ambient sediment and pore water monitoring requirements Condition 29 – Ambient marine water quality monitoring requirements	Refer to Section 3.5.
	Solid waste leachate (solid waste drying and storage facility)	Pathway: Overland runoff during rainfall events, resulting in direct discharge to marine environment Impact: Impact to marine environment and ecological health		Refer to Section 3.1	C = Minor L = Rare Low risk	Y	Condition 2 – Stormwater management Condition 10 – Infrastructure and equipment operational requirements Condition 28 – Ambient sediment and pore water monitoring requirements Condition 29 – Ambient marine water quality monitoring requirements	The Delegated Officer has determined the proposed controls for managing solid waste leachate at the solid waste drying and storage facility to be adequate. No additional regulatory controls are required.

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

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

3.3 Detailed risk assessment for potential impacts of noise emissions

3.3.1 Overview of the risk event and potential impact

The premises is located within the Geraldton township and with a number of residential, light industrial, and commercial premises located to the east, south, and west of the premises (Figure 7). In particular, residential premises are located as close as 200 m from the premises boundary and are classified as ‘noise sensitive premises’ under the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations).

The current loading and unloading of vessels, storage, and handling of bulk material at the premises may result in noise emissions beyond the premises boundary, with the proposed increase in throughput capacity of 23,000,000 tonnes per annual period potentially increasing the risk of unacceptable noise levels received at nearby sensitive receptors.

In considering the proposed increase in throughput, no additional infrastructure or equipment will be constructed or operated, with the increase being facilitated by maximising the capacity of existing infrastructure at each berth. As such, no new or additional noise sources will be introduced as a result of the amendment, and the existing daily throughput capacity of 160,000 tonnes will not be altered. It is expected that daily noise emissions during loading and/or unloading events will remain relatively unchanged, though the number of these events will likely increase.

3.3.2 Noise impact assessment

To determine whether the proposed increase in annual throughput to 23,000,000 tonnes per annual period will be able to comply with the relevant assigned noise levels at sensitive receptors as outlined in the Noise Regulations, the Licence Holder undertook a noise impact assessment (AES 2023). Major noise sources at the premises included the Berth 3, 4, 5, and 7 shiploaders, dust collectors, and conveyors.

Site measurements were taken at the premises to (i) determine the sound power level of individual equipment and plant, as well as (ii) measure the night-time noise levels at 15 reference locations. The sound power level measurements were taken primarily on equipment and areas owned by the Licence Holder (e.g., truck unloader shed vent, dust extraction fan, conveyor, pump, blower, alarms, etc.), as well as the rail unloader facility and ship-loading equipment at Berth 7. No measurements were taken from Berth 1, 2, 4, and 5 or the common user rail and truck unloading facilities as they were not operational during the site visit⁹.

The Licence Holder modelled noise emissions from a realistic operational scenario consisting of the simultaneous operation of four of the seven berths, which occurred 18.8% of the time during the 2022/2023 annual period¹⁰. Four worst-case operation scenarios were simulated¹¹,

⁹ Sound power levels were assumed at these locations were assumed to be the same as those measured in 2015 for a previous environmental noise impact assessment.

¹⁰ It is understood that the Licence Holder had previously undertaken environmental noise modelling on the simultaneous operation of five berths, which occurred 4% of the time annually. After corresponding with the department, the Licence Holder aimed to update the noise impact assessment to simulate more realistic port operational scenarios, while still capturing potential worst-case scenario (i.e., simultaneous operation of four berths).

¹¹ A fifth operating scenario (Scenario 3) was also simulated to predict worst-case alarm operation, where the Berth 5 boom alarm (assumed to have been replaced by broadband Squawker alarms) were operated simultaneously with the Berth 7 shiploader Long Travel Alarm. In accordance with regulation 3(1) of the Noise Regulations, the Noise Regulations do not apply to noise emissions associated with safety warning devices. Therefore, this operational

including:

1. **Scenario 1** – Day-time ship-loading operation, which included the operation of Berths 3, 4, 6, and 7, associated dust collectors, rail and truck unloading facilities, road trains, vacuum trucks, excavator, forklifts, service trucks, elevated work platforms, mobile crane, etc.).
2. **Scenario 1A** – Evening and night-time ship-loading operation, which has the same configuration as Scenario 1 but with no excavator and only one vacuum truck, forklift, and service truck operating.
3. **Scenario 2** – Alternative day-time ship-loading operation, which has the same configuration as Scenario 1, but with Berth 5 operating instead of Berth 4.
4. **Scenario 2A** – Alternative night-time ship-loading operation, which has the same configuration as Scenario 2 but with no excavator and only one vacuum truck, forklift, and service truck operating.

Noise levels for the four operational scenarios were predicted at 11 receptor locations (i.e., comprising six residential premises and five commercial premises) (Figure 7) under calm and worst-case winds in eight cardinal directions (Table 7). The operational scenarios generate continuous noise emissions and were assessed against assigned noise levels L_{A10} , adjusted for tonality.

Based on predicted noise contours generated for default “worst-case” meteorological conditions (data not shown), it was evident that wind direction has a significant impact on noise propagation. North-easterly to south-easterly winds enhanced noise propagation from the premises towards western receptors R1, R2, and R11, while westerly to northerly winds increased the noise levels received at eastern receptors R3 to R10.

Worst-case scenario modelling has identified some assigned noise level exceedances at several receptors under all operational scenarios, particularly during evening and night-time operations (Table 7). To better understand the likelihood of these exceedances, the annual occurrence percentage was calculated based on the annual percentage occurrence for the worst-case windspeeds (i.e., 4 m/s in daytime and 3 m/s in evening and nighttime) in different wind directions, as well as annual percentage of these operational scenarios occurring. These are summarised as:

- During daytime operation, an exceedance may occur at short-term residential receptor R10 (due to tonality adjustment) for up to 1.5 dB (under Scenario 1) and 0.8 dB (under Scenario 2) above the assigned noise level, for up to 0.6% of the time in a year, when the wind direction is south-westerly to north-westerly. The predicted noise emissions from the premises are at similar levels as daytime background noise levels at residential receptor R1.
- During daytime operation on Sunday and public holidays, an exceedance may occur at residential receptor R2 for up to 2.2 dB (under Scenario 1) and 0.8 dB (under Scenario 2) above the assigned noise level, for up to 0.5% of the time in a year, when the wind direction is north-easterly to south-easterly. The predicted noise levels at receptor R2 are lower than daytime background noise levels, though noise emissions from the premises may be inaudible at the receptor.
- During evening operations, exceedances may occur at residential receptors R2, R3, R4, and R10, with the greatest exceedance occurring at receptor R2 for up to 6.9 dB (under

scenario was not assessed. However, the assessment found that daytime and night-time predicted noise levels were similar in this scenario. Furthermore, the use of broadband Squawker alarms at Berth 5 was (continued on next page) able to reduce noise emissions by up to 4.1 dB, with further reductions achievable if the Berth 7 alarm was also replaced with broadband Squawker alarms.

Scenario 1) and 5.2 dB (under Scenario 2) above the assigned noise level, for up to 1% of the time of the year, when the wind direction is north-westerly to southerly. The likelihood of the other exceedances ranged between 0.1% (i.e., receptor R4 during westerly to northerly winds under Scenario 2) and 0.4% (i.e., receptor R3 and R4 during south-westerly to northerly winds under Scenario 1). These are detailed in Table 8. The predicted noise levels at receptors R2 to R4 are at similar levels as evening time background noise levels.

- During night-time operations, exceedances may occur at receptors R1 to R4, R7, and R10, with the greatest exceedance occurring at receptor R2 for up to 11.9 dB (under Scenario 1) and 10.2 dB (under Scenario 2) above the assigned noise level, for up to 1.7% of the time of the year under all eight cardinal wind directions. The likelihood of other exceedances ranged between 0.2% (i.e., receptor R10 during south-westerly to north-westerly winds under Scenarios 1 and 2) and 1.7% (i.e., receptors R2, R3, and R4 during all eight cardinal wind directions under Scenario 1). These are detailed in Table 8. The predicted noise emissions from the premises are at similar levels as night time background noise levels at residential/noise sensitive receptors and may be inaudible.

Table 7: Predicted worst-case noise levels in dB(A), adjusted for tonality

Receptor	Assigned noise level (daytime/evening ¹)	Predicted noise level during day time, L _{A10} in dB(A) ²		Assigned noise level (night-time)	Predicted noise level during evening and night time, L _{A10} in dB(A) ²	
		S1	S2		S1	S2
R1	48 / 43	41.8	39.3	38	42.0	39.5
R2	47 / 42	44.2	42.8	37	48.9	47.2
R3	57 / 52	49.0	47.0	47	53.6	51.4
R4	52 / 47	44.8	42.8	42	49.5	47.3
R5	53 / 48	40.8	40.6	43	40.6	40.4
R6	60 / 60	46.6	46.6	60	51.6	51.6
R7	47 / 42	39.9	39.8	37	39.9	39.8
R8	60 / 60	51.7	51.7	60	56.5	56.5
R9	60 / 60	51.6	51.1	60	56.4	55.8
R10	60 / 60	61.5	60.8	60	61.1	60.4
R11	60 / 60	57.5	59.7	60	56.6	59.3

Note 1: Assigned noise levels for daytime is listed for (i) Monday to Saturday, as well as (ii) Sunday and public holidays. The assigned noise levels for daytime on Sunday and public holidays is the same as the assigned noise levels for evenings.

Note 2: Red, bolded values indicate exceedance of corresponding assigned noise level. Exceedances of evening and night-time assigned noise levels are shown together.

Table 8: Evening and night time exceedance summary

Receptor	Assigned noise level, L _{A10} in dB(A)	Scenario 1A			Scenario 2A		
		Exceedance (dB)	Non-compliance wind direction	Annual occurrence percentage	Exceedance (dB)	Non-compliance wind direction	Annual occurrence percentage

<i>Evening time</i>							
R2	42	1 – 6.9	NW-S	1%	2.1 – 5.2	N-S	1%
R3	52	1.2 – 1.6	SW-N	0.4%	---	---	---
R4	47	1.7 – 2.5	SW-N	0.4%	0.1 – 0.3	W-N	0.1%
R10	60	1.0 – 1.1	SW-NW	0.3%	0.2 – 0.4	SW-NW	0.3%
<i>Night time</i>							
R1	38	3.9 – 4.0	N-SE	1.2%	1.4 – 1.5	N-SE	1.2%
R2	37	3.3 – 11.9	ALL	1.7%	1.8 – 10.2	ALL	1.7%
R3	47	0.3 – 6.6	ALL	1.7%	2.0 – 4.4	SW-NE	0.3%
R4	42	0.4 – 7.5	ALL	1.7%	1.0 – 5.3	SW-NE	0.3%
R7	37	1.1 – 2.9	SW-NE	0.3%	1.0 – 2.8	SW-NE	0.3%
R10	60	1.0 – 1.1	SW-NW	0.2%	0.2 – 0.4	SW-NW	0.2%

While the noise model has indicated the potential for exceedances at a number of receptors, the likelihood of the exceedance occurring is based on the prevailing wind direction and, to a lesser extent, the operational configuration at the premises. Consequently, the predicted exceedances have a very low annual percentage occurrence, with the highest being 1.7% of the time during night-time operation.

The assessment also noted that the premises is located close to the Geraldton city centre and is surrounded by commercial premises. Consequently, background noise levels were variable and is relatively high around the premises and surrounding area. At some receptors, the Licence Holder noted that the background noise levels measured were higher than the relevant assigned noise level.

Noise from traffic (including rail and heavy haulage road network in the Geraldton Southern Transport Corridor) and sea waves (including the Point Moore and Separation Point intertidal reefs) are present throughout the day and night. Furthermore, the Licence Holder noted that noise emissions from the neighbouring grain storage shed fans were the dominant and audible noise source at most of the night-time reference locations, whereas noise from the port operation and ship-loading activities were inaudible at all reference locations.

While this makes it difficult to demonstrate compliance with the assigned noise levels, noise emissions from the premises may be masked by the high background noise level and be inaudible. Model verification with measured noise level could not be undertaken due to ambient noise being dominated by noise from other sources not related to the premises operation.

The Delegated Officer has reviewed the information regarding noise emissions from operation of the premises at annual throughput capacity of 23,000,000 tonnes per annual period and has found:

1. The methodology adopted in the noise impact assessment (AES 2023) appear to be reasonable and correct. The operational scenarios selected for noise modelled and assessment appear representative and realistic of the premises operation, with the 11 receptors selected for the noise compliance assessment appearing representative and sufficient.
2. The department understands that marginal assigned noise level exceedances were

predicted under the certain worst-case meteorological conditions. It is also understood that the likelihood of such meteorological conditions occurring are relatively low (<2%).

3. As a reference, the previous draft EPA Guidance No. 8 – Guidance for Environmental Noise specified that “*The EPA policy is that compliance with the assigned noise levels need to be demonstrated for 98 per cent of the time, during the ‘day’ and ‘night’ periods indicated below, for the month of the year in which the ‘worst case’ weather conditions prevail*”. Based on the noise impact assessment, compliance with the Noise Regulations and the relevant assigned noise levels can be demonstrated for 98% of the time.
4. As the proposed amendment will not include the operation of additional infrastructure or equipment, noise emissions from the premises under worst-case meteorological and operational conditions is unlikely to increase.
5. As a result of the above information, it has been determined that additional regulatory controls for managing noise emissions are not required be conditioned in the amended licence. Nevertheless, having predicted some potential assigned noise level exceedances under worst case scenarios, the Licence Holder should proactively investigate and implement potential opportunities for noise mitigation (refer to Section 3.3.3).

3.3.3 Licence Holder’s control

To manage noise emissions from the premises, a number of recommendations were outlined in AES (2023), including improvements to infrastructure and equipment at Berths 3, 4, 5, and 7. These included:

- Enclosing the shiploading conveyors, drives, and chutes at Berths 3, 5, and 7.
- Installing silencers to the exhausts of dust collectors on the Berth 5 conveyor circuit and wrapping high noise dust works.
- Sealing gaps around conveyor hoods and increasing insertions to reduce impact forces associated with the existing Berth 4 conveyor system.
- Maintaining all equipment regularly to ensure they operate as designed.

While most of these recommendations will be implemented, recommendations around enclosing conveyors, drives, and chutes at Berths 3 and 7 will require further consultation with third-party operators, as the Licence Holder does not own or operate the infrastructure at these berths. The department has not considered the controls proposed at these berths as they have not been implemented yet.

Furthermore, to validate the noise model predictions, the Licence Holder proposed to undertake validation monitoring at spot locations around the premises, using the following methodologies:

- Attended noise monitoring, which allows for removal of background noise sources or other unrelated sources, which provides high confidence in measured noise data; and
- Unattended noise monitoring at three locations within the premises, which allows for noise data to be measured over a longer period of time. However, noise data may be impacted by background noise sources and/or wind-induced noises. Noise data during periods when wind speeds are greater than 5 m/s will be excluded.

In the long term, the Licence Holder has developed a Noise Improvement Plan (NIP) for Berths 4 and 5, as well as clear noise management objectives and targets for third-party operators at Berth 3 and 7. The aim of the NIP is to achieve an overall reduction in noise emissions from shiploaders and dust extraction systems. While the Licence Holder noted that noise emissions from alarms were exempt from the Noise Regulations, they acknowledged that these noise

sources contribute to the tonality of noise received at noise sensitive premises. As such, the Licence Holder also intends to remove the tonality component from alarms throughout the premises, as part of the NIP.

So far, under the NIP, the Licence Holder has undertaken an integrity and system optimisation of the Berth 4 bulk handling facility's dust extraction system and are in the process of replacing existing dust collectors with quieter dry fogging units. Going forward (up until 2026), the Licence Holder intends to implement the following programs (in chronological order), in accordance with the NIP:

- Procure and trial broadband Squawker alarms for shiploader boom, shuttle, and track.
- Conduct routine occupational noise survey to target known noise sources and alarms.
- Develop a detailed program of works for noise remediation that prioritises equipment based on sound output, height, and age of asset.
- Review dust collectors owned by the Licence Holder within the bulk handling facilities and prioritise the installation of silencers on exhaust systems.
- Review the premises' Noise Management Plan to broaden scope and set goals and objectives.
- Determine if more efficient and low noise dust management technology exists.
- Request operators within the premises to undertake noise surveys and develop noise improvement plans, as required.

3.3.4 Risk assessment and regulatory controls

In considering the predicted level of unacceptable noise emissions and the timing of its occurrence, the consequence of the risk event was determined to be **moderate**. The likelihood of this risk event was determined to be **unlikely**, due to the frequency and annual percentage occurrence of unacceptable noise emissions predicted by the noise impact assessment. The resultant risk rating is **medium risk**.

As a result of the noise impact assessment, controls proposed by the Licence Holder and the risk rating for the relevant risk event, the department has included the following conditions in the amended licence:

- **Condition 38 to 41** – New conditions to require validation noise monitoring (as detailed in Section 3.3.3) to verify the predicted noise levels from the premises' operation within 180 days of this amendment being granted (refer to Section 3.3.2).

The department understands that the Licence Holder is continually improving noise mitigating infrastructure, equipment, and operational practices at the premises, primarily through their Noise Improvement Plan, noting that the noise impact assessment has predicted some exceedances of the relevant assigned noise levels under worst-case scenarios.

3.4 Detailed risk assessment for potential impacts of dust emissions

3.4.1 Overview of the risk event

The current loading and unloading of vessels, storage, and handling of bulk material at the premises may result in dust emissions beyond the premises boundary, with the proposed increase in throughput capacity to 23,000,000 tonnes per annual period potentially increasing the risk of unacceptable dust emissions received at nearby sensitive receptors.

As the premises is located within the Geraldton township, with a number of residential, light industrial, and commercial premises located to the east, south, and west of the premises,

adequate management of dust emissions is considered integral. Specifically, two risk events were considered in this detailed risk assessment:

1. Unacceptable level of dust emissions from the premises impacting nearby amenity, with the most sensitive receptor being users and leaseholders at the adjacent Fishing Boat Harbour, resulting in excessive dust deposition on buildings and cars, staining, corrosion and/or damage to boating infrastructure and vessels,
2. Unacceptable level of dust emissions from the premises impacting nearby human receptors, with the most sensitive receptors being nearby residential premises (e.g., houses, retirement village, caravan parks) and primary school to the south-east and south-west of the premises, as well as users and leaseholders of the adjacent Fishing Boat Harbour, resulting in adverse health impacts.

3.4.2 Characterisation of emission and potential impact

Multiple potential sources of dust and dust-producing are present at the premises, including:

- Unloading of bulk materials from trucks and train at unloader facilities;
- Managing product stockpiles within and outside of storage sheds;
- Use of conveyors and transfer towers to move bulk materials through the premises;
- Ship loading and unloading of bulk material;
- Road sweeping and other maintenance activities, and
- Dust lift-off from unsealed surfaces and disturbed ground.

Fugitive dust emission composed of particulate matter (PM), ranging in diameter from 0.005 μm to 100 μm , and are typically categorised by size, expressed as equivalent aerodynamic diameter (EAD) in micrometer (μm), as follows:

- Total suspended particulates (TSP), which generally includes PM of all diameters up to 100 μm ;
- PM_{10} , which includes PM with an EAD less than or equal to 10 μm ; and
- $\text{PM}_{2.5}$, which includes PM with an EAD less than or equal to 2.5 μm .

Exposure to PM may result in short-term (acute; e.g., eye or breathing irritation) and long-term (chronic) health impacts. While PM_{10} and $\text{PM}_{2.5}$ are not visible to the naked eye, they can be readily inhaled through the nose and throat to enter the lungs, with the latter potentially entering the bloodstream. For assessing health impacts, the *National Environmental Protection (Ambient Air Quality) Measure* specifies daily (24-hour) and annual average criteria for PM_{10} as 50 $\mu\text{g}/\text{m}^3$ and 25 $\mu\text{g}/\text{m}^3$, respectively (NEPC 1998). These values are relevant assessment criteria for this risk assessment.

TSP, including PM with diameter greater than PM_{10} , are typically considered nuisance dust. While they are large enough to become trapped in the upper respiratory tract and excreted from the body, they can impact the local amenity and social surroundings as a result of deposition, soiling, and abrasion.

Additionally, PM can be made up of a variety of components, including nitrates, sulfates, organic chemicals, metals and metalloids, as well as allergens. The chemical composition of PM, especially PM_{10} and $\text{PM}_{2.5}$ may present additional adverse health risks, if inhaled. Deposition of TSP may also result in contamination of nearby soil and/or marine waters. The chemical composition of fugitive dust emissions from the premises would be dependent on the bulk material (summarised in Table 1) and its chemical composition being stored and handled during periods of strong winds.

Based on complaints received by the Licence Holder in the past five years, the most prevalent

dust emission issue related to continued impacts to local amenity at the adjacent Fishing Boat Harbour, which is the closest sensitive receptor (refer to Section 2.5). Users and leaseholders of the Fishing Boat Harbour have lodged complaints relating to excessive dust deposition on moored vessels, which have resulted in accelerated oxidation, staining, and pitting, as well as necessitating the need for more frequent washing, maintenance works, and replacement of impacted vessel parts. Characteristics of the dust described in the complaints were primarily either black, red, or pink, and have been attributed to the handling of iron ore at the premises. Indeed, the spike in dust complaints from the Fishing Boat Harbour during the 2021/2022 annual period coincided with the introduction of additional iron ore exports and the reactivation of inactive sheds and truck unloading circuits¹².

Similar complaints have also been received for white talc dust. Currently, talc is the only bulk material that is stored at the premises as an open stockpile (i.e., not within an enclosed shed), located south of the Fishing Boat Harbour. Complaints of dust deposition impacting areas outside of the Fishing Boat Harbour were also received, including nearby residential (e.g., dwelling roof, rainwater tank) and commercial premises (e.g., open-air workshops) as well as general surroundings (e.g., roads and associated infrastructure, dermal contact with avifauna) albeit at a lower frequency.

In addition to impacts to amenity, a number of complaints were made relating to the potential adverse health impacts from continued exposure to fugitive dust from the premises, primarily in the form of allergic reactions and skin rashes¹³, as well as respiratory infection.

Due to the siting of the premises, ambient dust concentrations within the premises' surroundings may also be elevated due to offsite sources, such as other industries and sand blasting activities, sea salt spray, and beach sand liftoff (in addition to fugitive dust emissions from the operation of the premises), leading to cumulative impacts on nearby sensitive receptors.

3.4.3 Dust impact assessment

Based on historical dust monitoring at the four existing ambient air quality monitoring stations around the premises, it was evident that:

- Exceedance of the PM₁₀ annual average concentration were consistently observed at the monitoring stations, except at the Berth 1 monitoring station, which is marginally below the assessment criteria of 25 µg/m³. The highest PM₁₀ annual average concentration throughout the 2022/2023 annual period was observed at the Port Way monitoring station, at 38.2 µg/m³.
- Exceedances of the PM₁₀ 24-hour average guideline value were consistently observed at the monitoring stations.
- Throughout the 2022/2023 annual period, the highest number of exceedances was observed at the Port Way monitoring station (n=69), and the lowest number of exceedances at the Berth 1 monitoring station on the east side of the premises (n=21). Interestingly, the offsite background monitoring station reported up to 26 exceedances.
- In the same annual period, activities at the premises contributed to only approximately up to 45% of PM₁₀ 24-hour average exceedances observed, based on the Licence Holder's calculations. This potentially reflects the presence of offsite dust sources, which are detected at the monitoring stations.
- The only exception is the Berth 1 monitoring station, where despite detecting the lowest

¹² During the 2021/2022 annual period, there was also a significant increase in the number of PM₁₀ exceedances detected at the Connell Road monitoring station, which is located near the Fishing Boat Harbour.

¹³ All complaints of fugitive dust causing allergic reactions and skin rashes to date related to grain dust, likely from Berth 3, which is not regulated under existing licence L4275/1982/15.

number of exceedances, up to 85% of the observed exceedances were attributable to the premises' operations. This may be due to proximity of the monitoring station to the grains handling and loading operations at Berth 3.

To determine whether the proposed increase in annual throughput to 23,000,000 tonnes per annual period will result in an increase to dust emissions from the premises' operation, the Licence Holder undertook a wind and dust dispersion analysis (Ramboll 2023b).

The analysis utilised Computational Fluid Dynamics (CFD) to model 3D wind flow around complex-built structures, including dust particulate emissions, flow, and deposition onto surfaces and receptor locations. A conservative approach was applied to model parameters in order to minimise underestimation of daily dust concentrations¹⁴. Background ambient dust concentrations were not considered to ensure that the analysis assessed impacts from dust sources from the premises only.

A number of operational scenarios were simulated, considering the increase in operational throughput capacity, potential wind fences, mitigation measures, and dust contributions from grain handling at Berth 3 (Table 9). For the purposes of this assessment, Scenario 2c was the most relevant as it reflects the amended annual throughput capacity and proposed dust management controls. Scenario 2c (G) was also relevant in considering cumulative dust impacts to surrounding receptors.

Table 9: Wind and dust dispersion analysis operational scenarios

Scenario	Annual throughput capacity (tonnes per annum)	Grain handling included?	Wind fence included?	Mitigation measures included
Base case	13,000,000	No	No	None
Forecast 1	19,000,000	No	Yes	None
Scenario 2a	23,000,000	No	Yes	None
Scenario 2b	23,000,000	No	Yes	<ul style="list-style-type: none"> Talc stockpile enclosed in a shed.
Scenario 2c	23,000,000	No	Yes	<ul style="list-style-type: none"> Cascade chute on Berth 4. Fogger unit on Berth 5. Dust extraction unit on grain rail unloader. Dust extraction on Lease 13 and Lease 88 truck unloaders. Dust extraction on enclosed MWPA truck.
Base case (G)	13,000,000	Yes	No	None
Forecast 1 (G)	19,000,000	Yes	Yes	None
Scenario 2a (G)	23,000,000	Yes	Yes	None
Scenario 2b (G)	23,000,000	Yes	Yes	<ul style="list-style-type: none"> Talc stockpile enclosed in a shed.

¹⁴ Conservative approach was applied to the wind and dust dispersion analysis by: (i) applying conservative estimates to the efficacy of mitigation measures, (ii) calibrating base case emission estimates against historical monitoring data from existing monitoring stations, (iii) applying garnet dust characteristics to all dust emissions from mineral sands, as it is the dustiest bulk material being handled at Berth 4, (iv) assuming iron ore loading was undertaken while the material was below the required dust extinction moisture (DEM) level, and (v) excluding implementation of contingency actions, including temporary cessation of loading during high dust lift-off events.

Scenario	Annual throughput capacity (tonnes per annum)	Grain handling included?	Wind fence included?	Mitigation measures included
Scenario 2c (G)	23,000,000	Yes	Yes	<ul style="list-style-type: none"> • Cascade chute on Berth 4. • Fogger unit on Berth 5. • Dust extraction unit on grain rail unloader. • Dust extraction on Lease 13 and Lease 88 truck unloaders. • Dust extraction on enclosed MWPA truck.

At each nearby sensitive receptor, the predicted PM₁₀ annual average dust concentrations and predicted annual number of days where the PM₁₀ 24-hour average assessment criteria were exceeded are shown in Table 10 and Table 11. Table 10 details predicted dust statistics considering background dust from other potential dust sources, whereas Table 11 details predicted dust statistics from the premises as the sole dust source (including grain handling). In relation to Scenario 2c (G), which is the most realistic scenario for the proposed activities, the following findings were made:

- The PM₁₀ annual average assessment criteria may be exceeded at the Fishing Boat Harbour, caravan park, and closest residential premises. Exceedance of the PM₁₀ 24-hour average assessment criteria was predicted at all receptors, with up to 115 exceedances at the Fishing Boat Harbour, as well as around 28 and 27 exceedances at the caravan park and closest residential premises, respectively.
- The inclusion of grain handling in the analysis resulted in an increase in predicted dust statistics. Cumulative dust impacts as a result of this inclusion were predicted to most significantly impact sensitive receptors to the east of the premises, close to where the grain handling infrastructure are located, including the closest residential premises and overnight caravan park. Exceedance of the PM₁₀ 24-hour average assessment criteria at the closest residential premises and overnight caravan park were predicted to increase from two to 27 days and zero to 11 days, respectively.
- Background ambient dust concentrations contributed to some of these exceedances. When considering dust emissions from the premises only, the number of days where the PM₁₀ 24-hour average criteria was exceeded reduced significantly. For example, exceedances at the Fishing Boat Harbour reduced from 115 exceedances to 59 exceedances. Exceedances were not predicted at some sensitive receptors (e.g., retirement village, primary school) when only dust emissions from the premises were considered.
- Generally, predicted dust statistics for Scenario 2c indicated higher dust impact compared to the Base Case, as a result of an increase in throughput capacity. However, the statistics were typically lower compared to Forecast 1 statistics. This suggested that an increase in throughput capacity at the premises may be managed through implementation of adequate dust mitigation measures.
- Maximum PM₁₀ 24-hour average concentrations in Scenario 2c were not predicted to increase significantly compared to the Base Case concentrations, except at Fishing Boat Harbour (data not shown).
- Overall, the Fishing Boat Harbour was likely to be most impacted by the existing and proposed activities at the premises, followed by the caravan park to the west. Sensitive receptors to the east of the premises, such as the closest residential premises and overnight caravan park, were likely to be impacted by grain-handling activities.
- Predicted dust statistics at existing monitoring stations correlated with predicted dust

statistics at sensitive receptors. Specifically, predicted dust statistics were relatively higher at the Lemmon Road monitoring station followed by the Connell Road monitoring station, reflecting their siting around the impacted Fishing Boat Harbour. On the other hand, the Berth 1 monitoring station and Port Way monitoring station exhibited greater increases in predicted dust statistics where grain handling were considered in the analysis.

- However, predicted dust statistics (from the Base Case (G) scenario) were typically higher compared to dust statistics derived from historical monitoring data, suggesting that actual dust emissions and associated assessment criteria exceedances may not be as severe as predicted in the analysis.
- Due to their siting, exceedances were predicted more readily at the monitoring stations, compared to at the sensitive receptors, suggesting that detection of exceedance at monitoring stations may provide opportunities for proactive dust management before excessive dust emissions reach and impact sensitive receptors.

The Delegated Officer has reviewed the information regarding wind and dust dispersion analysis as well as the wider dust impact assessment and has found:

1. Based on advice from the department's internal subject matter experts, the department understands that, while it is able to provide unique insights regarding air flow around complex shapes that cannot be modelled through conventional air quality dispersion models, CFD is considered a non-standard model that has not been demonstrated for use in dust impact assessments to date.
2. Several limitations were identified in the CFD analysis, relating to meteorological input, emissions rate estimates, as well as derivation of cumulative impacts. This feedback was provided to the Licence Holder for consideration.
3. Furthermore, due to large uncertainties in estimating fugitive dust emission rates, the modelling of fugitive dust emissions is generally not considered a reliable quantitative indication of risk. Where dust modelling indicates an increase in dust impacts and current monitoring indicates criteria are already being exceeded, greater effort needs to be placed on improving the mitigation of dust emissions.
4. It is understood that, when assessed comparatively, it is evident that the proposed activities (i.e., throughput increase to 23,000,000 tonnes per annual period) may result in an increase in dust emissions from the premises, with the Fishing Boat Harbour being the most impacted receptor (i.e., amenity). While there are no site-specific assessment criteria for dust impacts on amenity, the predicted increase in dust emissions is likely to result in further impacts to amenity at the Fishing Boat Harbour.
5. Additional dust mitigation strategies and measures have been implemented, especially in response to high number of complaints received in previous years. The Delegated Officer will consider these measures, in addition to any proposed controls to be implemented, as part of this detailed risk assessment (refer to Section 3.4.4).

Table 10: Predicted PM₁₀ annual average dust concentration and number of days where PM₁₀ 24-hour average dust concentrations are exceeded at sensitive receptor locations (cumulative, including background concentration)

Receptor location	Predicted PM ₁₀ annual average concentration (µm) ² [Assessment criteria = 25 µg/m ³]						Predicted annual number of exceedances of PM ₁₀ 24-hour average dust concentrations ² [Assessment criteria = 50 µg/m ³]					
	Base case	Forecast 1	Scenario 2c	Base case (G)	Forecast 1 (G)	Scenario 2c (G)	Base case	Forecast 1	Scenario 2c	Base case (G)	Forecast 1 (G)	Scenario 2c (G)
Fishing Boat Harbour	34.5	43.8	40.2	36.6	46.3	41.9	63	120	104	75	132	115
Caravan park	22.0	27.9	24.8	23.4	29.7	26.3	13	37	20	18	47	28
Closest residential premises	17.4	18.7	17.7	24.9	27.8	25.6	2	5	2	28	38	27
Overnight caravan park	16.2	17.0	16.6	19.7	21.2	20.2	0	0	0	10	15	11
Retirement village	16.3	17.0	16.4	16.6	17.3	16.7	0	1	0	1	1	1
Foreshore and playground	16.9	18.3	17.5	18.6	20.3	19.1	0	2	1	4	9	5
Primary school	15.9	16.4	16.0	16.3	16.9	16.4	0	0	0	0	1	1
Berth 1 monitoring station ¹	17.0	18.7	17.5	23.7	26.6	23.9	1	3	1	27	39	26
Connell Road monitoring station ¹	39.5	55.3	46.5	43.6	60.6	51.2	103	188	135	123	209	164
Lemmon Road monitoring station ¹	56.1	87.6	84.2	58.4	90.1	85.9	157	229	229	164	233	232
Port Way monitoring station ¹	19.8	24.4	21.9	44.6	54.9	46.5	11	25	18	101	125	109

Note 1: Existing monitoring locations are not considered sensitive receptors. As such, the relevant assessment criteria do not apply at these locations.

Note 2: Red, bolded values indicate annual average dust concentrations that exceed the assessment criteria.

Table 11: Predicted PM₁₀ annual average dust concentration and number of days where PM₁₀ 24-hour average dust concentrations are exceeded at sensitive receptor locations (from premises only)

Receptor location	Predicted PM ₁₀ annual average concentration (µm) ² [Assessment criteria = 25 µg/m ³]						Predicted annual number of exceedances of PM ₁₀ 24-hour average dust concentrations ² [Assessment criteria = 50 µg/m ³]					
	Base case	Forecast 1	Scenario 2c	Base case (G)	Forecast 1 (G)	Scenario 2c (G)	Base case	Forecast 1	Scenario 2c	Base case (G)	Forecast 1 (G)	Scenario 2c (G)
Fishing Boat Harbour	19.5	28.8	25.2	21.6	31.3	26.9	29	68	51	36	81	59
Caravan park	7.0	12.9	9.8	8.4	14.7	11.3	5	16	8	8	23	10
Closest residential premises	2.4	3.7	2.7	9.9	12.8	10.6	1	1	1	18	24	17
Overnight caravan park	1.2	2.0	1.6	4.7	6.2	5.2	0	0	0	5	6	6
Retirement village	1.3	2.0	1.4	1.6	2.3	1.7	0	0	0	0	1	0
Foreshore and playground	1.9	3.3	2.5	3.6	5.3	4.1	0	0	0	1	3	1
Primary school	0.9	1.4	1.0	1.3	1.9	1.4	0	0	0	0	0	0
Berth 1 monitoring station ¹	2.0	3.7	2.5	8.7	11.6	8.9	1	1	0	14	22	11
Connell Road monitoring station ¹	24.5	40.3	31.5	28.6	45.6	36.2	55	121	73	72	150	98
Lemmon Road monitoring station ¹	41.1	72.6	69.2	43.4	75.1	70.9	113	194	194	118	199	199
Port Way monitoring station ¹	4.8	9.4	6.9	29.6	39.9	31.5	7	16	12	83	105	86

Note 1: Existing monitoring locations are not considered sensitive receptors. As such, the relevant assessment criteria do not apply at these locations.

Note 2: Red, bolded values indicate annual average dust concentrations that exceed the assessment criteria.

3.4.4 Licence Holder’s controls

To manage dust emissions from the premises, the Licence Holder has implemented a number of dust mitigation measures, which are summarised in Table 4.

Due to a significant increase in the number of dust-related complaints received in the 2021/2022 annual period, the Licence Holder designed and implemented a port-wide Dust Management Plan (DMP) in 2022. The DMP is underpinned by several key dust management principles, including implementation of dust extraction and suppression systems, bulk material product handling procedures, as well as adequate product moisture conditioning.

The DMP is publicly available on the Licence Holder’s webpage and outlines roles and responsibilities, operational controls, monitoring programs, and contingency measures for dust emissions. These are summarised in Table 12. Furthermore, all third-party berth users are required to develop and submit their own DMP to align and comply with the objectives and target of the Licence Holder’s port-wide DMP.

Table 12: Summary of Dust Management Plan

Topic	Description
Management actions	<p data-bbox="395 837 483 869"><u>General</u></p> <ul data-bbox="395 882 1407 1435" style="list-style-type: none"> <li data-bbox="395 882 1407 943">• Facilities leased third-party operators will be inspected by the Licence Holder at regular intervals to ensure dust mitigation measures are in place and effective. <li data-bbox="395 956 1407 1039">• Bulk material must be moisture conditioned to achieve a moisture content at or above the corresponding dust extinction moisture (DEM) level, as determined by Australian Standard AS 4156.6: <i>Coal preparation, Part 6: Determination of dust/moisture relationship for coal</i>. <li data-bbox="395 1052 1407 1135">• Representative sampling and analysis of bulk material handled must be completed to demonstrate adequate moisture conditioning at or above the corresponding DEM level prior to shiploading. <li data-bbox="395 1149 1407 1232">• Where DEM cannot be practically achieved due to the bulk material’s high fines content, material handling characteristics, or high transportable moisture limit, alternative methods and controls must be implemented to prevent excessive dust emissions¹⁵. <li data-bbox="395 1245 1407 1305">• Adequate moisture conditioning must also be achieved for bulk material being transported to the premises. <li data-bbox="395 1319 1407 1435">• A street sweeper and/or vacuum truck must be operated at regular intervals on sealed roadways, around infrastructure, and on berths, to remove potential material spillage. Unsealed open areas and roadways must either be sheeted with gravel or have appropriate dust suppression applied. <p data-bbox="395 1449 834 1480"><u>Dust extraction and suppression systems</u></p> <ul data-bbox="395 1494 1407 1771" style="list-style-type: none"> <li data-bbox="395 1494 1407 1599">• Dust extraction systems (including ducting, filtration, and baghouses for collection of PM) must be in place and operational on all iron ore and metal concentrate storage sheds, whenever dust-generating activities (including stockpile disturbance) are being undertaken within the storage sheds. <li data-bbox="395 1612 1407 1695">• Dust extraction systems on all iron ore and metal concentrate storage sheds must ensure a negative pressure environment when all doors are closed, with doors being closed whenever dust-generating activities may occur. <li data-bbox="395 1709 1407 1771">• Dust extraction systems and dust suppression systems must be in place on conveyors, transfer points, and shiploaders (as required) to minimise excessive dust emissions, with

¹⁵ Bulk materials at the premises where relevant DEM level cannot be practically achieved include: garnet, mineral sands (including ilmenite, rutile, zircon, etc.), construction sands (i.e., clean fill), talc, iron concentrate, lead concentrate, fertiliser, and heavy mineral concentrate.

Alternative dust management controls include: use of cascade chute for garnet and ilmenite, water sprays for talc, dry fogging of vessel hold for lead sulphide and iron concentrates; meteorological limits for iron concentrate, wind shields on hoppers for heavy mineral concentrate, which are further discussed in Table 13.

Topic	Description
	<p>these systems routinely reviewed by suitably qualified experts to ensure they remain effective at all times.</p> <ul style="list-style-type: none"> • A maintenance system must be implemented to ensure faults and breakdowns in dust extraction and suppression systems are able to be rectified promptly. <p><u>Conveyor operation</u></p> <ul style="list-style-type: none"> • Dust covers and wind shields must be maintained on all conveyors to contain dust emissions and material spillage. • Integrated control systems should be in place to prevent overloading of conveyors and potential material spillage. • Foam must be applied to the metal concentrate once loaded onto the conveyor belt to reduce potential dust lift-off. However, as the handling of metal concentrates has fully transitioned to using the Rotainer box system at Berth 6, the application of foam is no longer required, though the equipment is currently retained at the premises. <p><u>Shiploading</u></p> <ul style="list-style-type: none"> • Shiploader booms must be positioned such that drop heights into vessel holds are minimised. • Shed doors must remain closed during shiploading events, where practical (excluding operations using external feed hopper facility). • Post-shipping berth handover procedures must be implemented to ensure appropriate mechanical sweeping and prompt removal of spilt materials from berth areas. • Where used, Rotainers must closed at all times when outside a vessel's hold during shiploading, until they are below the level of the deck. • Rotainer tipping in the vessel must occur no more two metres above the floor or material level to prevent dust plumes caused by tipping height. • Shiploading of metal concentrates must be supervised by the Licence Holder's Operations Supervisor and undertaken within the maximum 24-hour loading rate threshold, wind parameters limits, and appropriate moisture conditioning levels, which are outlined in the Licence Holder's <i>Metal Concentrate – Berth 4 Procedure</i> and <i>Loading Bulk Packaged Minerals Procedure</i>. Should these limits or thresholds be exceeded, shiploading must be temporarily suspended until conditions improve. <p><u>Discharging/unloading material from vessels</u></p> <ul style="list-style-type: none"> • Wind shields must be in place when using self-discharging hopper to unload heavy metal concentrate from vessels. • Spill deflector plates must be in place during unloading of coal and fertiliser to minimise potential spillage of material into the marine environment. <p><u>Truck and rail unloading</u></p> <ul style="list-style-type: none"> • Dust extraction and suppression systems must be installed and operational on all truck and rail unloaders entering the premises, with regular housekeeping and sweeping conducted around the unloading areas to remove potential material spillage. Where dust lift-off is occurring, either dust suppression or frequent mechanical sweeping should be employed. • Sweeping of truck wheels and wheel guards of side-tipping trucks must be undertaken to prevent tracking of residual material outside of truck unloader facilities or storage sheds. • Grain rail cars must be covered at all times while in transit. • All haulage trucks must be tarped when transporting material within the premises. <p><u>Handling of open stockpiles</u></p> <ul style="list-style-type: none"> • Dust suppression must be applied to minimise dust generation from open stockpiling of bulk materials. • Material stockpile height, volume, and drop height must be minimised as much as practicable to minimise excessive dust lift-off. • Stockpile disturbance should be temporarily suspended if excessive dust lift-off is occurring,

Topic	Description
	<p>until either wind conditions have improved, or effective dust suppression can be applied.</p> <ul style="list-style-type: none"> Shielding measures, such as wind barrier fencing, has been implemented to minimise dust lift-off from open stockpiles. <p><u>Handling of metal concentrates</u></p> <ul style="list-style-type: none"> Metal concentrate storage sheds must have additional infrastructure controls to minimise residual metal concentrate being brought out of storage sheds and premises boundary, including: <ul style="list-style-type: none"> Door interlock systems (to prevent more than one door being open at a time); Internal dust suppression systems (such as spray or fogging); and Wheel cleanings and floor sweeping equipment positioned permanently within storage sheds to. Additional operational procedures must be adhered to during handling of metal concentrates, in accordance with the Licence Holder's <i>Metal Concentrate – Berth 4 Procedure</i> and <i>Loading Bulk Packaged Minerals Procedure</i>.
Monitoring program	<p><u>Fixed monitoring stations</u></p> <ul style="list-style-type: none"> There are four fixed monitoring stations around the premises: Berth 1, Port Way, Lemmon Road, and Connell Road (Figure 8). Each monitoring station is equipped with a tapered element oscillating microbalance (TEOM) and two high volume air samplers (Hi-Vol) for real-time monitoring of PM₁₀ concentrations (10-minute interval) and sampling of metal pollutants (copper, manganese, lead, nickel, and lithium as PM₁₀), respectively. Wind parameters, temperature, and humidity are also measured at each monitoring station. Monitoring undertaken at these stations allow for potential impact to sensitive receptors surrounding the premises to be assessed in real time (for PM₁₀) as well as potential impacts from handling of metal concentrates. Real-time wind and PM₁₀ data are sent to the ENVIROSUITE database system every five minutes to calculate the arcs of influence, which enables the Licence Holder to identify dust emission direction, and subsequently, the emission source. A fixed monitoring station is also present in Bluff Point, further north of the premises, and is equipped with the Beta Attenuation Monitor (BAM) to monitor background PM₁₀ concentrations (location not shown). <p><u>Mobile e-samplers</u></p> <ul style="list-style-type: none"> A series of mobile e-samplers are located at strategic locations within the premises (Figure 8). The e-samplers are used to continuously monitor real-time PM₁₀ concentrations to assess likely dust contributions from different activities within the premises. <p><u>Dust deposition gauges</u></p> <ul style="list-style-type: none"> A dust deposition monitoring program was established at the Fishing Boat Harbour in 2016. The program was designed to assess amenity impacts from nuisance dust deposition at the Fishing Bot Harbour, as well as infer potential dust sources upwind of the Fishing Boat Harbour¹⁶.

¹⁶ While the continued monitoring of dust deposition at the Fishing Boat Harbour is useful for determining long-term impacts to amenity, and potentially human health, the department has not included the existing dust deposition monitoring program in the amended licence. This is due to (i) the lack of site-specific (continued on next page) assessment criteria for assessing the relevant impact (i.e., amenity and potential damage to vessels; refer to Section 3.4.2) and (ii) the relatively long averaging period for sample collection, making the monitoring program ill-suited for identifying fugitive dust emission events (as they occur) that subsequently result in complaints from users of the

Topic	Description
	<ul style="list-style-type: none"> • Potential upwind dust sources comprise activities from two zones of influence (Figure 8): <ul style="list-style-type: none"> ○ Six dust deposition gauges have been installed. Dust from activities not controlled by the Licence Holder include grain handling activities and is monitored via dust deposition gauge DML1. Dust from activities controlled by the Licence Holder include mineral sands and talc storage, as well as operation of the rail corridor, which are monitored via dust deposition gauges DML2, DML3, DML5, DML6, and DML7. ○ One dust deposition gauge (DML4) is located at Bluff Point, within the fixed BAM monitoring station to measure background dust deposition. <p><u>Meteorological station</u></p> <ul style="list-style-type: none"> • The Licence Holder operates two real-time meteorological stations. Tower 501 station was installed within the premises at the western end of Berth 4 in 2018 (Figure 2), while the Beacon 1 station was at an offshore location north-west of Berth 7 in 2008. • Beacon 1 station is used for shipping purposes, while Tower 501 station is used to assess meteorological conditions at and around the premises, including prevailing seasonal wind patterns. • The station is connected to an ENVIROSUITE database system to assess required actions for dust management.
<p>Trigger levels and corrective actions</p>	<p>Specific triggers relating to dust emissions are specified, including relevant corrective actions and relevant responsible personnel. Triggers considered include:</p> <ul style="list-style-type: none"> • Exceedance of real-time PM₁₀ monitoring target, as calculated and notified by ENVIROSUITE database system, triggered if dust levels from the premises direction are likely to result in either: <ul style="list-style-type: none"> ○ One-hour average PM₁₀ concentration of 100 µg/m³ or higher; or ○ Time weighted average PM₁₀ concentration of 15 µg/m³ prior to 06:00, 25 µg/m³ prior to 12:00 or 40 µg/m³ prior to 18:00; or ○ 24-hour average concentration of 50 µg/m³ or higher. • Moisture level of bulk material handled reported below the required DEM threshold. • Public complaints relating to excessive dust emissions. <p>Corrective actions arising from the breach of any of these triggers typically include an assessment of potential dust sources and weather conditions, as well as reducing and/or ceasing dust-generating activities (until weather condition improves or additional dust mitigation measures are implemented to control emissions).</p> <p>Corrective actions will also be taken where specific triggers are not met but visible dust emissions are observed during shiploading.</p> <p>Determination of a port-influenced exceedance of the PM₁₀ 24-hour average is undertaken manually by the Licence Holder, separate from the ENVIROSUITE system.</p>
<p>Objectives and targets</p>	<p>The DMP considers potential impacts to public health, public amenity, as well as environmental values surrounding the premises. Targets and associated performance indicators outlined include:</p> <ul style="list-style-type: none"> • Maintaining ambient PM₁₀ concentrations below the limit specified in existing licence L4275/1982/15 and with no net increases as a result of expansion to the premises, based on continued monitoring at air quality monitoring stations. • Receiving no complaints relating to dust emissions from the premises operations.

Fishing Boat Harbour. Real-time continuous monitoring of ambient PM₁₀ via the TEOM monitors are considered adequate.

Nevertheless, the Licence Holder is encouraged to continue implementing the dust deposition monitoring program, which may yield insightful information into identifying any long-term dust depositional patterns, identifying potential dust sources, as well as informing long-term dust management strategies at the Fishing Boat Harbour.

Licence: L4275/1982/15

Topic	Description
	<ul style="list-style-type: none"> Reporting no incidents where dust emissions and deposition has resulted in pollution to soil or marine environment.
Stakeholder consultation	<p>Primary stakeholders relating to dust management at the premises include:</p> <ul style="list-style-type: none"> Third-party berth operators – meet quarterly; Customers and leaseholders – meet regularly; Fishing Boat Harbour Consultation Committee – meet quarterly; Stakeholder Consultation Committee – meet quarterly; and State regulatory agencies – meet as required.
Reporting	<p>Annual Environmental Report and quarterly air quality monitoring report are submitted to the department, as specified in existing licence L4275/1982/15. Relevant complaints are also reported to the department, as part of the Annual Environmental Report.</p> <p>These reports, as well as ambient air quality data from monitoring stations, are available on the Licence Holder's webpage.</p>
Changes to operations	<p>Any changes to the nature, characteristics, and/or composition of the bulk material, material handling infrastructure, handling methods and/or throughput volumes (including trials) will be assessed to ensure human, health, environmental, and amenity values are managed appropriately and are compliant with existing licence L4275/1982/15.</p>



Figure 8: Dust and air quality monitoring network at the premises

Licence: L4275/1982/15

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In addition to the DMP, the Licence Holder established a Dust Steering Committee to initiate and oversee a series of dust improvement programs, which are summarised in Table 13.

Table 13: Dust improvement programs

Theme	Description
Dust extraction and suppression system	<ul style="list-style-type: none"> • To continuously improve dust mitigation measures at the premises, a review of the dust extraction system at the bulk handling facility was undertaken, with the findings used to drive a number of improvements to dust mitigation equipment. • Upgrades to the common user truck unloader's dust extraction system during mid-2023, including partial enclosure at southern end of facility, and fabrication of removable dust hoods to bring extraction points closer to the truck unloader hopper (Figure 9a and Figure 9c). • Installation of dry fog dust suppression system on the CV502 conveyor and Berth 5 shiploader as part of the iron ore handling circuit in 2024 (Figure 9b). Fog sprays were also installed along the shiploader conveyor system and at the loading chute. The system was trialled and determined to be more effective than the previous dust suppression system. • Upgrades to spray bars and extended enclosure, as well as installation of hydroscon system (i.e., bulk material moisture monitoring) on the iron ore loadout circuit at transfer tower TT500 at Berth 5. Dry fog system will continue to be implemented in the remaining transfer towers along the iron ore loadout circuit at Berth 5. • Refurbishment and recommissioning of the cascade chute at Berth 4 in March 2023 to minimise dust emissions from shiploading (Figure 9d). The cascade chute appeared to be effective at reducing dust emissions (i.e., up to 80% reduction compared to previous chute) and is able to handle garnet without significant dust liftoff. Going forward, shiploading of all garnet products at Berth 4 will be undertaken using the cascade chute. The cascade chute will be adjusted to facilitate operational efficiency. • Procurement of an additional cascade chute to handle other dust-generating bulk material, namely ilmenite (mineral sands), anticipated to be operational in early 2025. The existing cascade chute will also be adjusted to suit larger vessels, along for chute changes in the washdown bay. • Upgrades to the enclosure and shroud covers of the Berth 4 shiploader boom conveyor, where wind flow was reduced with curtains equipped at the head-end of the conveyor (i.e., where bulk material enters the chute). • Transition of metal concentrate handling to Berth 6 has enabled existing metal concentrate storage sheds at Berth 4, equipped with dust extraction system, to be used for storage and handling of mineral sands, lithium direct shipping ore, and spodumene concentrate.
Metal concentrate handling	<ul style="list-style-type: none"> • Handling of metal concentrate material has shifted from the partially open conveyor system at Berth 4 to the use of Rotainer ship loading method at Berth 6. The transition was completed in April 2023 for lead concentrate and in February 2024 for copper and zinc concentrate (with lithium and spodumene handling remaining at Berth 4). • The use of sealed containers eliminates the need for metal concentrate shed storage (i.e., delivered direct from mine sites), reduces handling and transfer points by eliminating the use of conveyors and conventional shiploaders, and shields the stored material from wind conditions and mitigates the risk of material spillage onto the wharf and marine environment. • The Licence Holder is currently implementing additional dust mitigation measures, including commissioning a new vessel-hold dry fog system to create a blanketing effect with dry fog droplets <10 µm (Figure 9g), re-engineering the Rotabox tipping mechanism to prevent Rotainer from being hung-up on the lifting lugs, and increasing road sweeping requirements within and outside the premises.
Fishing Boat Harbour	<ul style="list-style-type: none"> • To address excessive dust emissions at the Fishing Boat Harbour (i.e., as shown through complaints received, historical dust monitoring data, as well as wind and dust dispersion modelling), the Licence Holder has installed a DustTamer fence south of the open talc stockpile in April 2023 (Figure 9h). The fence was designed to reduce downwind wind speeds whilst maintaining air pressure equilibrium on both sides of the fence, limiting dust liftoff from the stockpile. The Licence Holder reported that monitoring of PM₁₀ concentrations upwind and downwind of the fence from April to October showed a

Theme	Description
	<p>reduction in high/peak PM₁₀ concentrations in the downwind monitor (Figure 10).</p> <ul style="list-style-type: none"> • Furthermore, a Geraldton Fishing Boat Harbour Development Plan was released in March 2023, which sets out the strategic direction for the growth and redevelopment of the Fishing Bot Harbour precinct, with an emphasis on appropriate zoning, considering commercial operation as well as future needs of stakeholders, maintaining and improving outcomes to public health and amenity. • A dust deposition monitoring program was established at the Fishing Boat Harbour in 2016 to assess the potential impacts of dust deposition and identify relevant dust emission sources from activities located upwind.
Others	<ul style="list-style-type: none"> • The Licence Holder is working with third-party users to implement dust mitigation measures along the rail corridor due to a number of complaints relating to this source, including: <ul style="list-style-type: none"> ○ Undertaking appropriate levels of moisture conditioning and dust suppression when exiting the rail corridor tunnel; ○ Regularly sweeping and washing down of rail corridor to remove residual material (Figure 9f); and ○ Wetting down of empty train wagons via spray bars at the rail unloader prior to leaving the premises (Figure 9e). • While grain material is not regulated under existing licence L4275/1982/15, the Licence Holder has worked with third-party grain operators on the following: <ul style="list-style-type: none"> ○ Including grain dust in port-wide wind and dust dispersion analysis (refer to Section 3.4.3); ○ Implementing dust extraction system on the grain train receipt facility, which is anticipated to be completed by the end of 2024; ○ Developing the Geraldton Grain Terminal Dust Management Plan and Dust Improvement Plan to address grain loading and handling infrastructure refurbishment and replacement over coming years; ○ Developing a standard operating procedure for dust management during grain loading, including agreed contingency measures based on real-time dust monitoring trigger levels, including altering shiploader position as low as possible in the vessel hold, partially closing vessel hatch covers to shield loading activities, reducing flow rates, and suspending loading if conditions do not improve.



Figure 9: Dust mitigation improvement programs

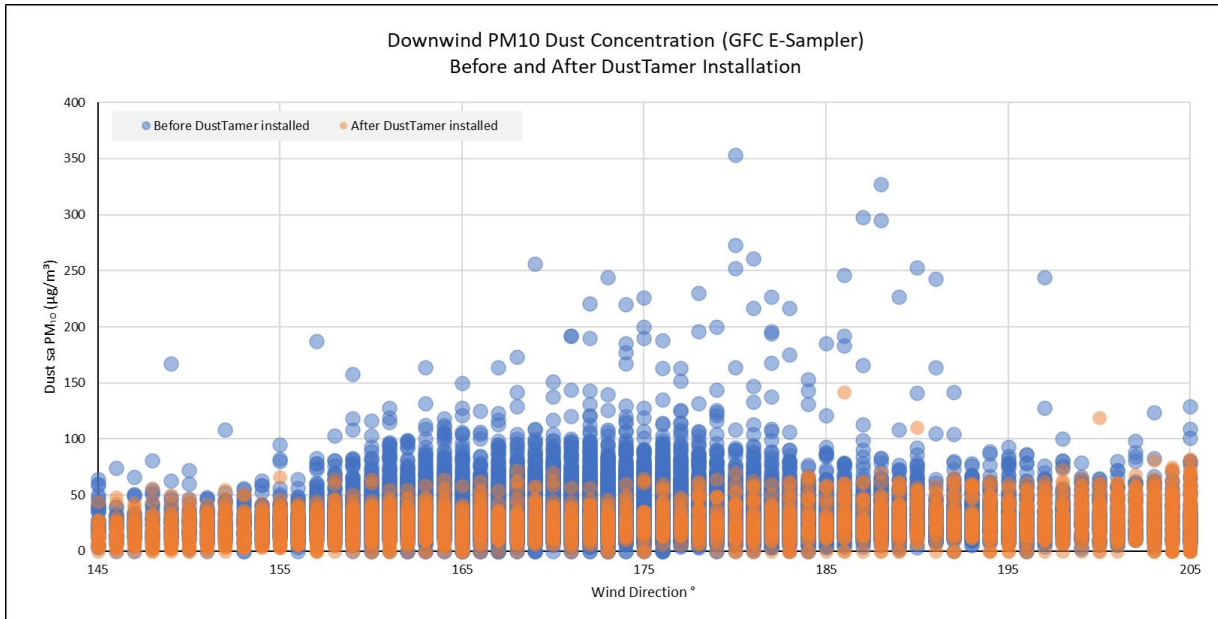


Figure 10: PM₁₀ concentration measured upwind and downwind of the DustTamer fence before and after installation

In addition, as a result of the wind and dust dispersion analysis (Ramboll 2023b) and monitoring network review (Ramboll 2023a), the Licence Holder intends to install an additional, temporary e-sampler west of the premises to assess potential impact of the premises' dust emissions on the caravan park to the west, as well as validate the predictions of the wind and dust dispersion analysis (refer to Section 3.4.3).

3.4.5 Risk assessment and additional regulatory controls

The proposed loading and unloading of vessels, storage, and handling of bulk material at a throughput capacity of 23,000,000 tonnes per annual period at the premises may result in elevated dust emissions, which may have various impacts on sensitive receptors. Based on the information available to the department, a risk rating (based on consequence and likelihood) has been assigned to each risk event relating to dust emissions (Table 14).

Overall, the risk rating related to dust emissions is **medium risk**. The department understands that the Licence Holder is continually improving dust mitigation measures at the premises, including equipment and operational practices, through their DMP and Dust Steering Committee.

As a result of the dust impact assessment, controls proposed by the Licence Holder and the risk rating for the relevant risk events, the department has conditioned relevant controls and modified existing conditions in the amended licence:

- **Condition 3** – Amended to include operation of dust extraction systems in all truck and rail unloader facilities, in addition to iron ore and metal concentrate storage sheds.
- **Condition 4** – New condition to require all bulk material regulated under L4275/1982/15 to be adequately moisture conditioned.
- **Condition 5** – New condition specifying dust mitigation controls required during loading and unloading of bulk material.
- **Condition 9** – Updated Table 1 to specify operational requirements for all bulk material regulated under licence L4275/1982/15, including authorised loading/unloading locations and handling methods for each bulk material, as well as additional dust mitigation requirements for specific bulk materials, where considered necessary due to the risk of potential dust impacts.

- **Condition 10** – New condition specifying operational requirements for rail unloader facilities and truck unloader facilities.
- **Condition 21** – Updated condition to ensure dust emissions, including from shiploading activities, do not cross the premises boundary. This is an additional regulatory requirement to better manage dust emissions from the premises, based on the throughput capacity at the premises, historical complaints and monitoring information, as well as the risk rating for the relevant risk events.
- **Condition 27** – Updated ambient air quality monitoring requirements in Table 4 to:
 - Include continuous, real-time monitoring of PM₁₀ using the existing TEOM monitors at the Berth 1, Lemmon Road, Port Way, and Connell Road air quality monitoring locations, including specification of a 24-hour average target of 50 µg/m³, in accordance with the NEPC (1998) guidelines. No changes were made to the location of the Connell Road monitoring station.
 - Authorise the Berth 1 monitoring station from either the existing or proposed location (refer to Section 2.3.2).
 - Specify the method of monitoring, including relevant Australian Standards for the monitoring program, which is in line with current licensing formatting. Australian Standard AS 3580.19 *Methods for sampling and analysis of ambient air, Method 19: Ambient air quality data validation and reporting* was included to maintain the integrity of collected monitoring data. It is an expectation that the Licence Holder's SAPs reflect the requirements of the relevant Australian Standards, and where it deviates from it, adequate justification is provided.
- **Condition 35** – Updated Annual Environmental Report requirements for the ambient air quality monitoring program to specify the format of monitoring information required.
- **Condition 36** – Updated reporting requirements for the ambient air quality monitoring program to:
 - Specify the format of the monitoring information required when submitting the quarterly air quality monitoring report. The amended condition places a greater emphasis on the reporting of air quality target exceedances (as specified in condition 27), while reducing reporting duplication between the Annual Environmental Report and quarterly air quality monitoring report.
 - Remove the requirement to submit a ET1 form within seven days of an air quality target exceedance being detected. It is expected that this information will be provided in the quarterly air quality monitoring report, thus reducing reporting duplication.

Furthermore, conditions 9 to 14 of existing licence L4275/1982/15, relating to the dust management of manganese ore handling, has been removed. The reporting requirements associated with these conditions, as specified in condition 41 of existing licence L4275/1982/15, have also been removed. The requirements of these conditions have either been transferred to or is duplicated by other new or existing licence conditions. The handling of manganese ore is still authorised under amended licence L4275/1982/15, though it is understood that there has not been any handling of manganese ore at the premises to date.

Table 14: Risk ratings for dust emissions from the premises

Risk event	Consequence	Likelihood	Risk rating
<p>Dust emissions impacting nearby human receptors, including nearby residential premises (e.g., houses, retirement village, caravan parks) and primary school</p>	<p>Moderate</p> <p>A number of human health receptors are present around the premises, with the closest long-term receptor being residential premises located approximately 200 m from the premises boundary.</p> <p>Health impacts from the inhalation of PM₁₀ dust has been well-characterised (refer to Section 3.4.2) and the dust emissions from the premises' surrounds have been observed and predicted to emit PM₁₀ concentrations exceeding the relevant assessment criteria under certain conditions (refer to Section 3.4.3).</p> <p>It is acknowledged that relatively elevated background ambient dust concentrations are also present around the premises due to other nearby dust sources, which contribute to the cumulative dust concentrations around the premises.</p>	<p>Unlikely</p> <p>Wind and dust dispersion analysis have shown varying numbers of potential exceedances of PM₁₀ 24-hour average concentrations at nearby human health receptors, though the frequency of exceedance is not expected to increase with the proposed expansion, except at the Caravan Park. The Licence Holder is proposing to install a temporary e-sampler to monitor and assess potential dust impacts to the Caravan Park.</p> <p>While the wind and dust dispersion analysis was shown to be more conservative compared to empirical data, the predictions should be considered carefully due to concerns on the suitability of the model methodology.</p> <p>More importantly, dust mitigation measures have been implemented, with continuous improvements being undertaken by the Licence Holder. This has corresponded with a reduction in public complaints, with limited number of complaints relating to health impacts from dust emissions (i.e., grain dust causing allergy/dermatological impacts).</p> <p>While grain (and other bulk materials; refer to Table 1) is not regulated under licence L4275/1982/15, the Licence Holder continues to work with third-party grain operators on dust mitigation improvements.</p>	<p>Medium risk</p> <p>The controls proposed by the Licence Holder has been included in amended licence L4275/1982/15.</p> <p>No additional regulatory controls are included in the amended licence, the department expects the Licence Holder to continue implementing and improving dust mitigation measures, as well as consulting with relevant key stakeholders.</p> <p>Dust monitoring should continue to be undertaken in accordance with amended licence L4275/1982/15. Internal trigger levels for PM₁₀ (as specified in the Licence Holder's DMP and associated documents) should be periodically reviewed to ensure they are relevant and adequate for proactive dust management for the protection of human health receptors.</p>
<p>Dust emissions impacting nearby amenity, including users and leaseholders of adjacent Fishing Boat Harbour.</p>	<p>Moderate</p> <p>The Fishing Boat Harbour is located directly west of the premises. While it is difficult to determine relevant assessment criteria for assessing impacts of dust emissions on public amenity, the Licence Holder has been consistently receiving public complaints, primarily from leaseholders and users at the neighbouring</p>	<p>Possible</p> <p>While there are no established (i.e., site-specific) assessment criteria for impacts to amenity, a large number of complaints have been made by leaseholders and users of the Fishing Boat Harbour. While the Licence Holder has implemented additional dust mitigation measures to address these complaints, complaints are still made periodically, albeit at lower frequencies compared to</p>	<p>Medium risk</p> <p>The controls proposed by the Licence Holder has been included in amended licence L4275/1982/15.</p> <p>No additional regulatory controls are included in the amended licence, the department expects the Licence Holder to continue implementing and improving dust mitigation measures, as well</p>

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Risk event	Consequence	Likelihood	Risk rating
	<p>Fishing Boat Harbour.</p> <p>Complaints related to excessive dust emissions from the premises being deposited on buildings, cars, and other infrastructure, as well as staining, corrosion, and/or damages to boating infrastructure and vessels. This has resulted in material impacts on harbour users, necessitating the need for more frequent washing, maintenance works, and replacement of impacted vessel parts.</p>	<p>those observed in the 2021/2022 annual period.</p> <p>Wind and dust dispersion analysis have predicted increased dust impacts at the Fishing Boat Harbour, in terms of annual average PM₁₀ concentration, maximum PM₁₀ 24-hour concentration, and annual number of days of PM₁₀ 24-hour average exceedances, necessitating further and continued dust mitigation. The proposed expansion may continue to have some degree of amenity impacts on the Fishing Boat Harbour, depending on the efficacy of existing and future dust mitigation measures implemented at the premises.</p>	<p>as consulting with relevant key stakeholders.</p> <p>Dust monitoring should continue to be undertaken in accordance with amended licence L4275/1982/15.</p> <p>The department emphasises the importance of real-time dust monitoring and management, as well as stakeholder consultation, for monitoring amenity impacts, especially at Fishing Boat Harbour. Any complaints received, including those from Fishing Boat Harbour users and leaseholders, should be considered and, where required, corrective actions taken, in line with the Licence Holder's DMP (refer to Section 2.5).</p>

3.5 Detailed risk assessment for potential impacts on marine environment

3.5.1 Overview of the risk event

The loading and unloading of vessels, as well as the storage and handling of bulk materials at the premises may result in emissions and discharges, either controlled or uncontrolled. Due to the premises' siting, these emissions and discharges may enter the marine environment. The proposed increase in bulk material handling throughput capacity to 23,000,000 tonnes per annual period may increase the volume and/or impact of these discharges to the marine environment, primarily through incidental spills of bulk material (i.e., a loss of containment), contaminated stormwater runoff, and washdown water discharges.

3.5.2 Characterisation of emission

As the proposed increase in throughput capacity will not introduce new types of bulk material or modifications to the premises' existing material handling and shiploading infrastructure, the characteristics of potential emissions as well as emission pathways remain unchanged from previous assessments.

The characteristics of emissions that may enter the marine environment is determined by the type of bulk material being handled at the premises. Existing licence L4275/1982/15 authorises and regulates a number of bulk granular materials, which are summarised in Table 1.

Bulk material may enter the marine environment in several pathways (assessed cumulatively as a single risk event), including:

- Loss of containment during loading or unloading operations, where bulk material is incidentally displaced either through mechanical failure or strong winds, resulting in direct discharge into the marine environment; or
- Spillage at the berths during material handling resulting in residue material being mobilised (either through wind or runoff) and entering the marine environment.

Furthermore, the proposed increase in throughput capacity, as well as discharge from stormwater outfalls SW16 and SW17, may also increase cumulative volume of stormwater and the associated contaminant loading being discharged into the marine environment. The contaminant loading being discharged from each stormwater outfall will differ depending on the berth they service.

As the proposed throughput increase will be achieved primarily by an increase in iron ore handling at Berth 5 and Berth 7, iron loading from discharges at stormwater outfalls SW10, SW11, SW12, SW13, SW16, and SW17 may increase as a consequence of increased material residue being mobilised by stormwater at the berths. The frequency of incidental spills associated with iron ore loading may also increase.

Due to the relatively lower throughput capacity increases at the other berths, there is unlikely to be a change in the characteristics and likelihood of emissions at these locations, either through loss of containment or stormwater outfalls. It is understood that the stormwater drainage network also accepts stormwater inputs from the wider catchment beyond the premises, encompassing nearby roads, residential, commercial, and light industrial areas that may not be occupied or managed by the Licence Holder. The proposed expansion is unlikely to change this aspect of the stormwater discharge.

Furthermore, the Licence Holder seeks authorisation to discharge treated washdown water from stormwater outfalls SW08 and SW09. As described in Section 2.3.4, the washdown water is generated from washdown of shiploading infrastructure, as well as the common-use ruck unloader and conveyor system at Berth 4.

As detailed in Section 2.3.6, the premises also contains a tail water return pipeline which connects the inner harbour to the dredge pond, which will not be assessed as part of this detailed risk assessment.

3.5.3 Potential impact of emission

The premises is located along Champion Bay, which is considered to be relatively pristine (Table 5). The emissions and discharges associated with bulk material handling activities at the premises has the potential to impact the marine environment. In particular, the inner harbour receives most, if not all, of discharges from the premises, which leads into the wider Champion Bay area and the Indian Ocean beyond. The benthic habitat within the inner harbour is expected to be routinely impacted by turbidity from vessel movements and seabed disturbances (e.g., bed levelling and dredging activities). A number of native marine fauna are known to frequent the inner harbour, including seabirds, sea lions, whales, dolphins, etc. In particular, the Australian sea lions (*Neophoca cinerea*), known to forage, rest and haul out on rock walls near the berths of the inner harbour, may be exposed to the contamination of marine waters and sediments.

As discussed in Section 3.5.2, impacts to the inner harbour marine environment will likely occur from discharges at the premises, which may include incidental spill and emissions due to a loss of containment of the bulk material being handled, fugitive dust liftoff that deposits into the marine environment, as well as direct discharge of stormwater and treated washdown water from dedicated stormwater. Due to this, the Licence Holder has undertaken environmental monitoring within the inner harbour marine environment, as well as beyond, to better assess potential impacts to marine waters and sediment. Existing monitoring information has been assessed to inform potential impacts from the proposed activities (refer to Section 3.5.4).

3.5.4 Marine impact assessment

Historically, ambient sediment quality monitoring and stormwater discharge quality monitoring has been undertaken at the premises periodically since at least 1999. In 2006, the Licence Holder established an annual sediment quality monitoring program, followed by a comprehensive biannual stormwater monitoring program in 2009.

Due to logistical challenges¹⁷, as well as the highly variable monitoring results and subsequent difficulties in data interpretation, stormwater quality monitoring was considered to be of limited value. In 2012, the licence was amended to remove requirements for stormwater discharge monitoring. At the time, it was determined that the annual ambient sediment quality monitoring program considered adequate for monitoring potential impacts from the premises' activities to the marine environment.

Monitoring locations under the existing monitoring program include areas near the berths, as well as the at the fishing boat harbour, tug pen, foreshore area, and offshore sites (which act as control sites). Sediment samples are analysed annually for metal and metalloids, as well as biennially for polycyclic aromatic hydrocarbons, tributyltin, total organic carbon, and particle size distribution. Where applicable, parameter concentrations are compared against toxicant default

¹⁷ Implementing the stormwater discharge monitoring program was a manual process, with logistical challenges including: (i) the frequency and duration of rainfall events did not reliably produce adequate flow to facilitate sample collection, (ii) safety concerns on access to stormwater collection points during rainfall events due to potential storm surge, (iii) safe access under wharf structures limited during rainfall events due to waves and tidal influence. Consequently, sample collection was not always feasible, resulting in frequent data gaps. Data interpretation was also complicated by the numerous stormwater sources within the catchment, some of which were not within the premises boundary and/or within the control of the Licence Holder.

guideline values¹⁸ (DGV) from the ANZG (2018) or, where DGVs are unavailable, against site-specific guideline values (SSGV) derived from control sites in accordance with EPA WA (2016).

Existing licence L4275/2010 also requires pore water sampling to be undertaken at several relevant monitoring locations in years where iron concentrate, lithium direct shipping ore, and/or spodumene concentrate are handled. While baseline monitoring was completed in 2022, no pore water monitoring has been undertaken as the relevant bulk materials have not been handled at the premises at the time of this assessment.

The following observations were made based on the most recent ambient sediment quality assessment in 2023 (O2 Marine 2023):

- Sediments within the inner harbour were typically silt-heavy, dark grey, with no odour, minimal organic matter, and no biota. These contrasted with sediments at the offshore control sites, which were generally yellow, coarser, and contained organic content (i.e., seagrass) as well as shell fragments.
- The DGV for aluminium, cadmium, copper, iron, lead, vanadium, and zinc were exceeded at a number of monitoring locations within the inner harbour¹⁹, with the GV-high for zinc exceeded at monitoring locations CH3 and CH4, associated with Berth 4 (Table 15). As the control sites contained coarser sediments, it was postulated that the SSGV derived for aluminium, iron, and vanadium were too conservative, where used for the derivation of SSGVs contains coarser sediments, it was postulated that the SSGV was overly conservative when applied to the siltier sediments at the inner harbour.
- Parameters with DGV exceedances were investigated further by measuring enrichment factors using lithium as a normalising parameter (i.e., a parameter unlikely to be impacted). Enrichment of aluminium and vanadium were considered not significant or minor. Enrichment of cadmium, lead, and iron in the inner harbour sediments ranged between moderate and severe, while enrichment of copper and zinc ranged between very severe and extremely severe (i.e., enrichment factor >25). Relatively speaking, monitoring locations CH1 to CH7 typically exhibited the greatest level of enrichment, as they were located along the berths. Enrichment factors greater than moderate were interpreted to indicate anthropogenic impacts exceeding the level of protection assigned to the slightly to moderately disturbed port harbour environment.
- The most recent bioavailability assessment undertaken in 2020 using dilute acid extraction returned concentrations below the limit of reporting for cadmium, lead, and zinc, with only copper detected. However, none of these parameters exceeded their relevant DGV. Elutriate (leachate) testing identified cadmium, copper, and lead below their respective limit of reporting, though zinc was detected at concentrations exceeding the DGV for 90% species protection level (ANZG 2018), suggesting that zinc could potentially impact marine water quality if sediments were disturbed. Nevertheless, elevated zinc concentrations appear limited to the inner harbour, especially closer to the berths.
- Monitoring results for the 2023 annual period were consistent with findings from previous monitoring, where sediment toxicant concentrations were generally higher within the

¹⁸ The ANZG (2018) provides two types of default guideline value toxicants of concern. DGVs indicate the concentrations below which there is a low risk of unacceptable impacts occurring and should be applied with other lines of evidence for the protection of aquatic ecosystems. In contrast, GV-high are the 'upper' guideline values and indicate the concentrations at which toxicity-related adverse impacts may already be expected to occur. GV-high guideline values should only be applied as an indicator of potential high-level toxicity issues, not as a guideline value for protection of ecosystems.

¹⁹ Aluminium, iron, vanadium (and total phosphorus) sediment concentrations were assessed against SSGV, derived in accordance with the EPA WA (2016) *Technical guidance: Protecting the quality of Western Australia's marine environment*.

inner harbour (and Fishing Boat Harbour), compared to sediments outside the harbour and at the offshore sites. In particular, metal and metalloid concentrations appear to be relatively elevated around Berth 4, which was attributed to prolonged handling of metal concentrates, historical ship loading and washdown practices, proximity to stormwater outfall, as well as potentially hydrodynamics within the inner harbour, which may concentrate wave energy and possibly sediments to the south-west corner of the harbour.

The assessment also recommended a review of the Licence Holder's sediment monitoring sampling and analysis plan (SAP), better alignment of the monitoring program with the EPA WA (2016) technical guidance, as well as undertaking bioavailability assessment during the next annual monitoring program.

Table 15: Median metal and metalloid concentrations during the 2023 ambient sediment quality monitoring program

Monitoring location	Aluminium	Arsenic	Cadmium	Copper	Lead	Lithium	Nickel	Zinc	Silver	Iron	Vanadium	Mercury
Limit of reporting (mg/L)	1	5	0.1	1	1	1	1.0	1	1	1	2	0.02
DGV ¹	680 ²	20	1.5	65	50	---	21	200	1	960 ²	10.6 ²	0.15
GV-high ¹	---	70	10	270	220	---	52	410	4	---	---	1
CH1	2400	9.3	1.2	140	53	5	3.4	380	<1	6600	19	0.07
CH2	1900	7.8	1.3	140	41	4	3.4	370	<1	6500	19	0.06
CH3	1900	7.8	2.0	180	56	4	4.2	590	<1	7800	18	0.07
CH4	1900	7.6	1.8	190	57	4	3.7	530	<1	6100	20	0.09
CH5	1300	6.2	0.9	96	21	3	2.5	230	<1	5200	14	0.03
CH6	2100	9.0	1.3	180	34	5	3.6	350	<1	7200	22	0.05
CH7	2300	7.1	1.2	200	32	6	5.3	300	<1	4200	18	<0.02
CH8	1300	<5.0	0.3	38	8.9	4	2.3	68	<1	1800	11	<0.02
CH9	840	5.3	0.4	44	8.5	3	1.8	90	<1	2600	14	<0.02
CH10	1100	5.8	0.4	50	8.6	3	2.5	100	<1	4000	12	<0.02
CS1	540	<5.0	0.1	<1	1.7	2	1	3	<1	590	7	<0.02
CS2	340	<5.0	0.1	<1	1.4	2	<1.0	2	<1	480	5	<0.02
ORA1	160	<5.0	<0.1	<1	0.5	2	<1.0	2	<1	230	<2	<0.02

Monitoring location	Aluminium	Arsenic	Cadmium	Copper	Lead	Lithium	Nickel	Zinc	Silver	Iron	Vanadium	Mercury
ORA2	110	<5.0	0.1	<1	0.5	3	<1.0	6	<1	180	<2	<0.02
FBH1	650	<5.0	0.2	240	29	4	2.4	250	<1	1400	9	0.07
FBH2	1400	5.9	0.2	160	17	5	3.0	200	<1	3500	14	0.06
YM1	1400	<5.0	0.2	60	9.4	4	1.6	46	<1	2500	11	0.03
TB1	1900	<5.0	0.2	28	12	4	2.7	47	<1	2000	15	0.06

Note 1: Yellow cells indicate exceedance of toxicant default guideline value (DGV), red cells indicate exceedance of upper guideline values (GV-high). Grey value indicates parameter detected below the limit of reporting.

Note 2: Site-specific guideline value derived in accordance with specifications outlined in the EPA WA (2016) *Technical guidance: Protecting the quality of Western Australia's marine environment*.

Additionally, the Licence Holder has also undertaken a passive water quality monitoring program for at the inner harbour since 2012 (refer to Section 2.3.5). Monitoring results to date have indicated the following:

- No exceedances of metal concentrations detected, with one copper exceedance at PWS2 (associated with Berth 4), as well as one lead and zinc exceedance at PWS4 (associated with Berth 7). Passive water quality measurements at these monitoring locations were compared against the ANZG (2018) DGV for 80% species protection level, due to the slightly to moderately disturbed marine environment where the stormwater outfalls are located.
- The Licence Holder has indicated that the exceedances observed at monitoring locations PWS2 and PWS4 were anomalous and may not be attributed to operations at the premises. Potential sources may include discharges from the vessels' exhaust gas cleaning systems and ballast water, which is not within the operational control of the Licence Holder.
- A number of exceedances were observed for copper, cobalt, and zinc at the PWSR reference site, near the entrance of the inner harbour. Passive water quality measurements at this monitoring location were compared against the ANZG (2018) DGV for 99% species protection level, due to the nature of the reference site.

The Delegated Officer has reviewed the information regarding ambient marine sediment quality assessment and has found:

1. The department does not agree with conclusions drawn in the ambient sediment quality assessment for the 2023 annual period (O2 Marine 2023), that metal and metalloid concentrations in sediments have generally decreased over time. This finding was not supported by the time-series plots shown in the assessment, nor was it supported by adequate statistical analyses, noting the width of the error bars plotted. The department recommends the application of appropriate statistical analyses to substantiate the trends observed.
2. Furthermore, the risk assessment based on the bioavailability assessment was not adequately supported, as it was based on a routine bioavailability assessment undertaken in 2020, rather than in response to DGV exceedances during the annual period. Consequently, the bioavailability assessment may have limited relevance to the current status of sediments. The department recommends that any bioavailability or toxicity assessment be undertaken immediately post-exceedance to provide a more robust and confident assessment.
3. The department agrees with the recommendations from the most recent ambient sediment quality assessment.
4. Specifically, updates to the sediment SAP should:
 - a. Provide adequate rationale for the determination and application of a naturally occurring normalising element, particularly in relation to the appropriateness and relevance of a normalisation approach in the context of the premises and its operations.
 - b. Include the additional stormwater and treated washdown water discharge locations (e.g., SW16 and SW17), as well as the tail water return pipeline (DPW1).
 - c. While the Licence Holder has attempted to couple various scientific approaches (i.e., normalisation using lithium) with the ANZG guidance to develop a site-specific methodology for assessing sediment impacts, the

Licence Holder has not provided a logical decision-tree framework, nor adequately substantiated the analytical decisions. Therefore, a site-specific decision tree should be included in the SAP, documenting the step-by-step procedures and rationale behind the sediment quality assessment framework.

- d. The use of monitoring locations ORA1, ORA2, and TB1 for the derivation of site-specific guideline values for aluminium, iron, vanadium, and total phosphorus may not be appropriate, as these monitoring locations are located close to the premises and may be impacted by the premises' operations. As such, monitoring information from these locations may not be fit for purpose, in accordance with the specifications outlined in EPA WA (2016). Nevertheless, the department supports continued inclusion of these locations in the monitoring program.
5. The ambient sediment quality monitoring program should continue to be undertaken, with the Licence Holder encouraged to implement changes to improve data integrity and the robustness of the assessment.

The Delegated Officer has reviewed the information regarding passive water quality assessment and has found:

1. As stated in Section 2.3.5, while the use of passive water quality samplers is useful at the premises, there are uncertainties around the methodology of the monitoring program, specifically in the derivation of time-weighted average concentrations and the applicability of marine water DGVs (ANZG 2018). As such, the reliability of the passive water quality monitoring data presented to date has not been assessed.
2. In reviewing the historical monitoring data available, the department also noted the high levels of variability in deployment time, ranging between three days and 84 days. While there is no universal averaging period for passive water quality monitoring, deployment times should consider factors such as: (i) the concentration of target parameters, (ii) selectivity and capacity of the parameter and binding layer combination, (iii) presence of competitive ions, (iv) extent of complexation in solution, (v) possibility of biofilm formation, etc. Furthermore, high variability in deployment times may compromise the integrity of the resultant data. For example, an averaging period of almost three months may lead to underestimation of target parameter concentration due to the sampler integrity being affected by biofouling and/or having reached capacity (i.e., saturation). Once an appropriate deployment time has been determined, the Licence Holder should endeavour to adhere to it.
3. In conditioning the passive water quality monitoring program in the amended licence L4275/1982/15, the department has specified an interim deployment period of 30 days (\pm five days), as requested by the Licence Holder. Analysis of passive water samplers may be undertaken using non-NATA-accredited methodologies. These may be revised in the future, based on further works to refine the monitoring program and the PWQMSAP.

3.5.5 Licence Holder's controls

To manage emissions and discharges from the premises from impacting the marine environment, the Licence Holder has implemented a number of controls, which are summarised in Table 4. Spill mitigation and management controls will continue to be implemented at the premises, including routine sweeping and clean-up of the berth to remove residual material, the use of spill plates during the unloading of bulk material from vessels, the use of Rotainers for soluble and/or high-risk bulk material (e.g., metal concentrates), adherence of meteorological triggers when iron concentrate may be loaded, as well as the deployment of dust management equipment and moisture conditioning to reduce dust liftoff and deposition into the marine

environment. No new controls were proposed.

In relation to stormwater discharge at the premises, the stormwater drainage network is equipped with sediment traps and/or HumeCeptor systems to treat stormwater prior to discharge. The additional stormwater outfalls SW16 and SW17 at Berth 7 are also equipped with similar controls.

The proposed discharge of treated washdown water from the Berth 4 stormwater outfalls SW08 and SW09 will also be treated through infiltration basin, HumeCeptors systems and sediment traps prior to discharge into the inner harbour marine environment (refer to Section 2.3.4). Furthermore, while washdown water associated with the handling of metal concentrates is not typically discharged to the marine environment, the Licence Holder has transitioned the handling of metal concentrates from Berth 4 to Berth 6 (except lithium direct shipping ore and spodumene concentrate). This further reduces the likelihood of potential soluble metal contaminants entering the washdown water waste stream at Berth 4. Finally, works approval W6893/2024/1 was granted in 2024 to authorise the construction of a new, upgraded common user truck unloader facility, which will incorporate an automated washdown water recycling process, further minimising the volume of washdown water that will be discharged into the inner harbour.

In addition, the Licence Holder also undertakes a number of monitoring programs within the inner harbour and surrounding marine environments (Figure 5), including:

1. Annual ambient sediment quality monitoring program at 16 monitoring locations around the premises and its surrounds;
2. Annual pore water quality monitoring program at up to seven monitoring locations around the premises and its surrounds, in annual periods where there was loading of either lithium and/or iron concentrate products;
3. Monthly passive water quality monitoring program at five monitoring locations around the premises;
4. Quarterly marine water quality monitoring program using conventional grab sampling at 15 monitoring locations around the premises, since June 2024; and
5. Stormwater and marine water monitoring during fertiliser and iron concentrate handling campaigns, respectively.

To prepare for future development plans under the PMaxP, the Licence Holder is also developing a site-specific Marine Environment Management and Monitoring Plan (MEMMP), which aims to establish a comprehensive framework to understand cumulative impacts of various inputs on the marine environment. The MEMMP will also integrate existing monitoring programs, as well as identify triggers and management actions for the protection of public health and environmental values at the inner harbour, as well as the wider Champion Bay. The department received the MEMMP on 26 March 2024, with preliminary feedback provided to the Licence Holder to enable further refinement. The MEMMP has not been assessed as part of this application.

3.5.6 Risk assessment and additional regulatory controls

The proposed loading and unloading of vessels, storage, and handling of bulk material at a throughput capacity of 23,000,000 tonnes per annual period at the premises may result in impacts to the neighbouring marine environment, especially at the inner harbour.

In considering the potential impacts through loss of containment of bulk material, as well as the discharge of treated stormwater and treated washdown water through stormwater outfalls., as well as the sensitivity of the inner harbour marine environment, the consequence of the relevant risk events was determined to be **minor**. Based on existing monitoring information, as well as the controls being implemented by the Licence Holder, the likelihood of these risk events was determined to be **unlikely**. The resultant risk rating is **medium risk**.

The department understands that the Licence Holder is continually improving the management of emissions and discharges into the marine environment, primarily through the development of the MEMMP. A robust risk management framework, established by the MEMMP, will be important for the assessment of any potential expansions to the premises. The department expects the Licence Holder to continue refining the MEMMP (and associated monitoring programs and SAPs), based on the feedback provided by the department.

As a result of the marine impact assessment, the department has conditioned relevant controls and modified existing conditions in the amended licence:

- **Condition 9** – Updated Table 1 to specify operational requirements for all bulk material regulated under licence L4275/1982/15, including authorised loading/unloading locations and handling methods for each bulk material, as well as the management and treatment of any washdown water that is generated from handling activities;
- **Condition 10** – New condition specifying operational requirements for rail unloader facilities and truck unloader facilities, including the management and treatment of washdown water generated at these facilities.
- **Condition 20** – Updated to authorise the discharge of stormwater from stormwater outfalls SW16 and SW17, as well as the discharge of treated washdown water from stormwater outfalls SW8 and SW9. Relevant abatement requirements were also included.
- **Condition 28** – Updated ambient sediment and pore water monitoring requirements to:
 - Separate the sediment and pore water components of the monitoring program into Table 5 and Table 6, respectively, for better clarity.
 - Specify limits for sediment parameters directly, based on the ANZG (2018) DGV, and, where DGV is not available for a particular parameter, require the derivation of site-specific guideline value based on the EPA (2016) *Technical guidance: Protecting the quality of Western Australia's marine environment*.
 - Specify limits for pore water parameters directly, based on the ANZG (2018) DGV for 95% species protection level, where available. The limit for (total) chromium was specified as 0.0044 mg/L, based on the DGV for hexavalent chromium, as a conservative measure.
 - Specify the method of monitoring, including relevant Australian Standards for the monitoring programs, in line with current licensing formatting. It is an expectation that the Licence Holder's SAPs reflect the requirements of the relevant Australian Standards, and where it deviates from it, adequate justification is provided. Where relevant Australian Standards are not available (i.e., pore water sampling), the department has referenced Simpson and Batley (2016) as general guidance.
- **Condition 29** – Updated the marine water monitoring program requirements to:
 - Include the quarterly surface water monitoring program via grab sampling, at 11 monitoring locations (refer to Appendix 2 for the exclusion of the remaining four monitoring locations). This is an additional regulatory requirement to complement the proposed passive water quality monitoring program, as outlined in Section 2.3.5. Monitoring parameters were based on bulk material handled at the premises, as well as monitoring parameters from the sediment and pore water monitoring program. The monitoring parameters may be amended based on any refinement made to the monitoring program, either as part of the development of the MEMMP or separately.
 - Include the monthly passive water quality monitoring program at four locations, as requested by the Licence Holder. Monitoring location PWSR was not included

in the amended licence (refer to Section 2.3.5). Specify the method of monitoring, including relevant Australian Standards for the monitoring programs, in line with current licensing formatting. It is an expectation that the Licence Holder’s SAPs reflect the requirements of the relevant Australian Standards, and where it deviates from it, adequate justification is provided. Where relevant Australian Standards are not available (i.e., pore water sampling), the department has referenced Simpson and Batley (2016) as general guidance.

- **Condition 30** – Updated the emissions and discharges monitoring program requirements to:
 - Include nitrate as an additional parameter in the monitoring program²⁰. This is an additional regulatory requirement, as nitrate is a relevant parameter when considering the impacts of fertiliser load on triggering algal blooms, consistent with the assessment undertaken in DWER (2021).
 - Amended the ‘nitrogen’ parameter to specify it as ‘total nitrogen’, to provide better clarity on monitoring requirements.
 - Specify the collection of stormwater from either the relevant stormwater outfall of the associated HumeCeptor (prior to discharge at the outfall). This was determined during the relevant amendment (DWER 2021), though the condition wording was not made sufficiently clear.
 - Specify the method of monitoring, including relevant Australian Standards for the monitoring programs, in line with current licensing formatting. It is an expectation that the Licence Holder’s SAPs reflect the requirements of the relevant Australian Standards, and where it deviates from it, adequate justification is provided.
- **Condition 35** – Updated reporting requirements for the ambient sediment and pore water quality, marine water monitoring, and stormwater discharge monitoring program to specify the format of monitoring information required when submitting the Annual Environmental Report.

4. Consultation

Table 16 provides a summary of the consultation undertaken by the department.

Table 16: Consultation

Consultation method	Comments received	Department response
Application advertised on the department’s website from 23 February 2024 to 15 March 2024.	A total of 13 submissions were received during the public comment period. Refer to Appendix 1.	Refer to Appendix 1.
Application advertised in the West Australian newspaper on 26 February 2024 and in the Geraldton Guardian newspaper		

²⁰ Based on historical Annual Environmental Reports, the department understands that the Licence Holder had been intending to monitor nitrate concentrations, in addition to the required nitrogen and ammonia concentrations in the existing condition.

on 27 February 2024		
City of Greater Geraldton advised of proposal on 23 February 2024	<p>The City of Greater Geraldton responded on 8 March 2024.</p> <p>While the increase in throughput was supported, there were concerns of the potential impacts on supporting road network (e.g., Geraldton-Mt Magnet Road, John Willcock Link, and Marine Terrace, Point Moore Road) and the nearby communities.</p> <p>A pertinent issue raised by local residents was dust generation from the premises, which may have potential impacts beyond the premises boundary.</p>	<p>The impacts of additional operational activities at the premises on surrounding road network is not within the scope of this assessment and has not been considered.</p> <p>The potential dust impacts from the proposed increase in throughput to 23,000,000 tonnes per annual period on surrounding human health receptors have been considered by the department and is provided in the detailed risk assessment in Section 3.4.</p>
Applicant was provided with draft documents on 27 September 2024.	<p>The Licence Holder provided comments on 18 October 2024.</p> <p>Further information was provided by the Licence Holder on 11 November 2024 to support the comments provided.</p> <p>Refer to Appendix 2.</p>	<p>The department has considered the comments and additional information provided by the Licence Holder in amending the licence.</p> <p>Refer to Appendix 2.</p>

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a revised licence L4275/1982/15 will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 17 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised licence as part of the amendment process.

Table 17: Summary of licence amendments

Condition no. in amended licence	Proposed amendments
Cover page	<p>Updated the cover page to:</p> <ul style="list-style-type: none"> • Increase Category 58 and 58A assessed production capacity from 16,000,000 tonnes per annual period (cumulative) to 23,000,000 tonnes per annual period (cumulative). • extend the licence duration from 17 March 2025 to 11 March 2035 and align the licence expiry date with the annual fee period.
Condition 3	Updated condition text to require operation of dust extraction systems for all rail and truck unloader facilities, in addition to iron ore and metal concentrate storage sheds.
Condition 4	New condition to ensure regulated bulk granular products are adequately moisture conditioned (i.e., at or above dust extinction moisture [DEM] level) or managed (if product cannot be adequately moisture conditioned).
Condition 5	New condition to require dust and spill mitigation equipment be operated during loading and unloading of regulated bulk granular products.

Condition no. in amended licence	Proposed amendments
Condition 6	Updated condition text to specify cargo as 'regulated bulk granular products', which is defined in Schedule 3 of the amended licence.
Condition 7	Updated condition text to specify iron ore, talc, mineral sands, mineral sands concentrate, metal concentrate, clean fill, and fertiliser as 'regulated bulk granular products', which is defined in Schedule 3 of the amended licence. The amended condition now requires collection of spillage of all regulated bulk granular products.
Condition 8	Updated condition text to specify spillage of regulated bulk granular products, which is defined in Schedule 3 of the amended licence.
Condition 9	<p>Updated Table 1 to:</p> <ul style="list-style-type: none"> • include all regulated bulk granular products that have been assessed and authorised under the licence to date; • specify authorised berth for loading and/or unloading activities, as well as the authorised handling method; • specify product-specific requirements for the management of dust emissions and/or potential discharges to marine environment • remove requirements that have been duplicated by conditions 3 to 8 in the amended licence; and • improve consistency in wording of the requirements across Table 1.
Condition 10	New condition to specify operational requirements existing truck unloader and rail unloader facilities, as well as the solid waste drying and storage facility.
Condition 11	Relocated existing condition 4 to condition 11 to better categorise the condition under the Trial conditions component of the licence.
Condition 13	Updated condition text to amend condition number referencing.
Condition 15	Updated condition text to amend condition number referencing.
Condition 20	<p>Updated Table 3 to:</p> <ul style="list-style-type: none"> • include SW16 and SW17 as authorised emission points for stormwater runoff; • include SW8 and SW9 as authorised emission points for treated washdown water from Berth 4 common user truck unloader and bulk handling facility circuit; and • include abatement requirements for the discharge of stormwater runoff and treated washdown water.
Condition 21	Updated condition text to ensure dust generated on the premises does not cross the premises boundary, including dust generated from shiploading and metal concentrate handling activities.
Condition 23	Updated condition text to revise to current licensing format.
Condition 24	Updated condition text to revise to current licensing format and specify minimum duration between monitoring events.
Condition 27	<p>Updated Table 4 to:</p> <ul style="list-style-type: none"> • remove limit as a specification as there are no limits specified for ambient air quality monitoring; • specify the relevant monitoring equipment for each parameter; • include Note 3 to allow Berth 1 monitoring station to be located at either the existing location or the proposed location; • include reference to relevant Australian Standards, in addition to the Licence Holder's internal sampling and analysis plans (Note 4);

Condition no. in amended licence	Proposed amendments
	<ul style="list-style-type: none"> • include particulate as PM₁₀ as a monitoring parameter, using tapered element oscillating microbalance monitor, with a specified target of 50 µg/m³ (in line with the existing target specified for particulate as PM₁₀ measured using high volume air sampler); • revise wording of Note 2 for clarity; • improve structure and formatting of Table 4.
Condition 28	<p>Updated Table 5 to:</p> <ul style="list-style-type: none"> • specify the relevant limit for each parameter, based on the relevant default guideline value from ANZG (2018), as referenced in the existing table; • specify the derivation of site-specific guideline value for parameters with no applicable default guideline value (Note 3). • specify monitoring frequency of polycyclic aromatic hydrocarbons, tribytyl tin, total organic carbon and particle size distribution analysis as biennial, instead of 'prior to 30 June in every second year', in line with current licensing format; • include reference to relevant Australian Standards, in addition to the Licence Holder's internal sampling and analysis plans (Note 2); • revise wording of Note 1 for clarity; • improve structure and formatting of Table 5, including separating the pore water monitoring program into a separate Table 6. <p>Updated Table 6 to:</p> <ul style="list-style-type: none"> • specify the relevant limit for each parameter, based on the relevant default guideline value for 95% species protection level from ANZG (2018), as referenced in the existing table; • include reference to relevant Australian Standards and other guidance documents, in addition to the Licence Holder's internal sampling and analysis plans (Note 1).
Condition 29	<p>Updated condition text to better align with specifications in Table 7.</p> <p>Updated Table 7 to:</p> <ul style="list-style-type: none"> • include the marine surface water monitoring program (via grab sampling), including the monitoring of 17 parameters at 11 locations on a quarterly basis; • include the marine surface water monitoring program (via passive samplers), including the monitoring of six parameters at four locations on a monthly basis; • specify the monitoring location for total iron during iron concentrate handling events, including reference to Figure 6; • include reference to relevant Australian Standards and other guidance documents. • include Note 1 to authorise total iron monitoring and passive water quality monitoring using non-NATA-accredited methods; and • improve structure and formatting of Table 7.
Condition 30	<p>Updated condition text to better align with specifications in Table 8.</p> <p>Updated Table 8 to:</p> <ul style="list-style-type: none"> • better specify the monitoring location; • include nitrate as a monitoring parameter; • include reference to relevant Australian Standards; • revise wording of monitoring parameter from 'nitrogen' to 'total nitrogen' for clarity; and • improve structure and formatting of Table 5.
Condition 34	Updated condition text to revise to current licensing format.
Condition 35	Updated condition text to revise to current licensing format.

Condition no. in amended licence	Proposed amendments
	<p>Updated Table 9 to:</p> <ul style="list-style-type: none"> include provision of product moisture content information, in relation to condition 4; include provision of ambient marine water quality monitoring information, in relation to condition 29 (Table 7); specify reporting format and form for ambient air quality, sediment, pore water, marine water and stormwater discharge monitoring programs, in relation to conditions 27 to 30 (Table 4 to Table 8); and remove reporting requirements for existing conditions 10 and 12, as these conditions have been removed from the amended licence (see below); and amended condition referencing for the reporting of particle size distribution of manganese ore product from the existing condition 13 (which was removed) to condition 9 (Table 1).
Condition 36	<p>Updated condition text to revise to current licensing format.</p> <p>Updated Table 10 to:</p> <ul style="list-style-type: none"> remove reporting requirements for existing conditions 11, 12, 13, 27, and 28, as these conditions have either been removed from the amended licence (see below) or are reported under the environmental report, as specified in amended condition 35; and specify reporting format and form for ambient air quality monitoring information, in relation to condition 27 (Table 4), including removal of form ET1.
Condition 37	<p>Updated condition text to revise to current licensing format.</p> <p>Updated Table 11 to:</p> <ul style="list-style-type: none"> include reporting requirements for limit exceedances relevant to condition 29 (Table 7).
Condition 38	<p>New conditions to require a validation noise monitoring program to be undertaken and an assessment completed to assess noise emissions against the relevant assigned noise levels in the <i>Environmental Protection (Noise) Regulations 1997</i> and predicted noise levels in acoustic assessment (AES 2023b), and, where compliance could not be demonstrated, to undertake further actions to mitigate noise emissions.</p>
Condition 39	
Condition 40	
Condition 41	
----	<p>Removed existing condition 9 relating to the management of dust emissions associated with the handling of manganese ore as it is adequately regulated under amended conditions 3, 5, 7, and 9.</p>
----	<p>Removed existing condition 10 relating to the management of potential spillages associated with handling of manganese ore as it is adequately regulated under amended conditions 5 and 7.</p>
----	<p>Removed existing conditions 11, 12, and 13 relating to the management of dust emissions associated with the moisture conditioning of manganese ore as it is adequately regulated under amended condition 4.</p>
----	<p>Removed existing condition 14 relating to the investigation of manganese ore particle size distribution as it has been added to amended condition 9.</p>
----	<p>Removed existing condition 40, as the requirements of the condition has been included in the amended condition 35 (i.e., environmental reporting requirements).</p>
----	<p>Updated Table 12 to:</p> <ul style="list-style-type: none"> include the definition of: AS 3580.19, AS/NZS 3580.9.6, AS/NZS 3580.9.8, AS/NZS 5667.1, AS/NZS 5667.9, AS/NZS 5667.10, AS/NZS 5667.12, EPA (2016) technical guidance, mg/kg, mg/L, regulated bulk granular products, Rotainer, Simpson and

Condition no. in amended licence	Proposed amendments
	<p>Batley (2016), STP, and suitably qualified acoustics professional;</p> <ul style="list-style-type: none"> • remove the definition of: ANZECC/ARMCANZ Guidelines, ANZG 2018, DGV, EPA 2005, fugitive emissions, metal concentrate shed, Midwest Ports Authority Air Quality Monitoring Sampling and Analysis Plan, Midwest Ports Authority Sediment Monitoring Sampling and Analysis Plan, Mtpa, PAH, PSA, TBT, TDS, TOC, TSP, and µg/kg, as they are either no longer referenced in the amended licence or are no longer needed to be defined; • amend the definition of 'metal concentrate' to include manganese ore, iron concentrate, and lithium direct shipping ore, in addition to the existing products; • amend the definition of 'shiploading event' to apply to the loading and unloading of all regulated bulk granular products, not only metal concentrates; and • amend the definition of 'Trial', to reference the correct amended condition numbers and Schedule 3 of the amended licence.
----	<p>Updated Schedule 1: Maps to:</p> <ul style="list-style-type: none"> • include new Figure 2 added to show site layout, including key infrastructure and equipment referenced in the amended licence conditions; • amend Figure 3 (previously Figure 2) to include additional emission points SW16 and SW17, as well as the location of gross pollutant traps; • amend Figure 4 to include existing and new proposed location of the Berth 1 monitoring station; • amend Figure 5 to include the locations of the marine water grab sampling and passive water sampling programs; • include new Figure 6 to show the location of marine water monitoring during iron concentrate loading events at Berth 6, as referenced in amended condition 29; and • removed existing Figure 3 (i.e., map of stormwater infrastructure and sampling locations for Berth 5 and 6), as it was no longer referenced in the amended licence conditions.
----	<p>Updated Schedule 2: Forms to remove form ET1, as this is no longer referenced in the amended licence conditions.</p>
----	<p>Updated Schedule 3: Regulated bulk granular products (Table 13) to:</p> <ul style="list-style-type: none"> • include all bulk granular products that have been assessed and authorised under licence L4275/1982/15; and • include the relevant authorisation date for each bulk granular product.

References

1. Acoustic Engineering Solutions (AES) 2023, *Environmental Noise Impact Assessment of Geraldton Port*, Ref: AES-890312-R02-0-21112023, Riverton, Western Australia.
2. ANZG 2018, *Australia and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian and New Zealand Governments and Australian state and territory governments, Canberra, Australian Capital Territory.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
5. DWER 2020b, *Guideline: Risk Assessments*, Perth, Western Australia.
6. Department of Water and Environmental Regulation (DWER) 2021, *Licence L4275/1982/15: Amendment Report*, granted 22 March 2021, Perth, Western Australia.
7. Environmental Protection Authority Western Australia (EPA) 2016, *Technical Guidance: Protecting the Quality of Western Australia's Marine Environment*, Perth, Western Australia.
8. O2 Marine 2023, *Geraldton Port Annual Sediment Compliance Survey – 2023*, Ref: 22ENV137/R220227, Geraldton, Western Australia.
9. National Environment Protection Council (NEPC) 1998, *National Environment Protection (Ambient Air Quality) Measure*.
10. Ramboll Australia Pty Ltd (Ramboll) 2023a, *Monitoring Network Review – Mid West Ports Authority*, Ref: 318001759, Perth, Western Australia.
11. Ramboll 2023b, *Wind and Dust Dispersion Analysis – Geraldton Port*, Ref: 318001497, Perth, Western Australia.
12. Simpson SL & Batley GE 2016, *Sediment Quality Assessment: A Practical Guide [Second Edition]*, CSIRO Publishing, Clayton South, Victoria.

Appendix 1: Summary of submissions received during public consultation period

Item	Public submission	Licence Holder's response	Department's response
<p>Note: During the period where this application was advertised for public comment, the department had also received and advertised an application submitted by the Licence Holder for a new works approval (W6893/2024/1) to authorise the construction and time limited operation of a replacement common user truck unloader facility at the premises. The works approval was granted on 11 June 2024.</p> <p>In reviewing public submissions, the department noted that some submissions did not specify which application they had intended to comment on or that the comments were relevant for both applications. As such, the department has decided to consider and address these comments in both applications. The public submissions are categorised below based on the concern/theme of the submission.</p> <p>A total of 13 public submissions were received and considered. Broadly speaking, the majority of the public submissions received related to the dust impacts at the Fishing Boat Harbour.</p> <p>These public submissions were also redacted and made available to the Licence Holder, who have also addressed the concerns raised in the submissions. The department has considered both the public submissions, as well as the Licence Holder's response (in conjunction with the information provided to support this application) in the risk assessment.</p>			
1	<p>13 public submissions reported severe impact to their vessels and equipment as a result of dust emissions from the premises. These primarily related to their ship vessels at the Fishing Boat Harbour, but also extended to other areas surrounding the premises, including public infrastructure and residential premises. Excessive dust emission and deposition have resulted in high maintenance costs and economic losses.</p>	<p>The Licence Holder acknowledged their responsibility in managing and improving the impacts from the premises activities on ambient air quality and has addressed several key areas:</p> <ol style="list-style-type: none"> Fishing Boat Harbour – The Licence Holder noted that the public submissions likely originated from the Fishing Boat Harbour stakeholder group, which comprises up to 130 individual members. The Licence Holder organises dedicated quarterly meetings to serve as a platform for stakeholders to raise concerns regarding the premises' operations and the Fishing Boat Harbour facilities. The Licence Holder also utilises these meetings to provide updates on dust improvement initiatives, as well as port development and maintenance activities. 	<p>The department has completed a detailed risk assessment to assess the potential impact of dust emissions from the proposed amendment to increase the throughput capacity of bulk material handling at the premises to 23,000,000 tonnes per annual period on human health and amenity values, including users and vessels at the Fishing Boat Harbour (refer to Section 3.4).</p> <p>The detailed risk assessment took into consideration the characteristics of the dust emission (Section 3.4.2), historical complaints (Section 2.5 and 3.4.2), public submissions for this application (Appendix 1), historical monitoring information (Section 3.4.3), as well as supporting information provided by the Licence Holder. The department has also reviewed the existing and proposed controls for managing dust emissions at the premises (Section 3.4.4), including the Licence Holder's Dust Management Plan (Table</p>
2	<p>Six public submissions were concerned about the proposed increase in throughput capacity at the premises, as it may result in further dust emissions, which would impact not only the premises' surrounds, but also the wide</p>	<ol style="list-style-type: none"> Complaints management – Quarterly air quality reports detail complaints and reports of property damage, which have declined due to stakeholder consultation and targeted improvement projects. Routine consultation with stakeholders and further dust 	

Item	Public submission	Licence Holder's response	Department's response
	Geraldton township.	improvement initiatives aim to address ongoing concerns. Investigations to date conducted by the Licence Holder have been inconclusive with respect to claims of property damage. Analysis of dust deposition monitoring data showed a sustained improving trend from mid-2023.	12) and dust improvement initiatives (Table 13). The outcome of the risk assessment is outlined in Section 3.4.5.
3	Four public submissions critiqued existing dust mitigation measures implemented at the premises (e.g., DustTamer, how excessive dust emissions is being calculated and determined, etc.), noting that they are ineffective and have not been successful in managing dust emissions to date.	3. Transparency in monitoring – The Licence Holder provided detailed descriptions of monitoring programs and monitoring locations on their website, along with quarterly and annual air quality reports. Real-time air quality data is available, with plans for more specific location-based monitoring data to be provided in the future.	Consequently, licence L4275/1982/15 has been amended to include new conditions relating to the management of dust emissions. Existing conditions were also reviewed and amended to ensure the standard of dust management required was adequate. These are outlined in Section 3.4.5.
4	Three public submissions were concerned about the potential health impacts relating to the dust generated from the handling of bulk materials at the premises, particularly iron and silica dust which have been linked to respiratory issues like silicosis. Concerns were not limited to the fraction of dust particulates, but also the chemical composition of the dust.	4. Dust management improvements – Significant investment in dust management infrastructure, including the DustTamer fence, has led to an observed 50% reduction in dust from the talc stockpile and an overall decreasing trend in the number of PM ₁₀ limit exceedances. However, challenges remain with iron ore dust emissions, which will be addressed through collaboration with third-party operators and enforcement of the dust management requirements specified in lease and access agreements.	Through the detailed risk assessment, the department considered that dust emissions and potential dust impacts can be adequately managed by the Licence Holder, noting that the Licence Holder should continue to plan and implement continuous dust improvements, as well as maintaining robust stakeholder consultation, especially with users at the Fishing Boat Harbour.
5	Three public submissions related to impacts of dust emissions from the premises on the environment, with impacts observed to date including discolouration of local wildlife, as well as impacts to surrounding vegetation and marine ecosystem.	5. Iron ore dust emissions – Increase in dust emissions have been attributed to new iron ore exports, which have necessitated infrastructure repairs and modifications. The Licence Holder continues to collaborate with their six iron ore exporters to improve product conditioning and dust controls.	While the department understands that dust plumes and events with excessive dust may still occur from time to time, it is the responsibility of the Licence Holder to monitor, assess, and rectify these issues as they occur, and ensure that they do not result in adverse impacts to human health and/or amenity (including infrastructure and equipment damages).
		6. Governance and accountability – The Licence Holder has established a Dust Steering Committee accountable to the Chief Executive Officer, focusing on continuous improvement projects to reduce fugitive dust emissions and associated complaints.	While environmental receptors were not directly assessed under the detailed risk assessment for dust emissions, the department has considered the potential impact of dust emissions on environmental receptors (Table 6). It is expected that the controls implemented to manage impacts to human health and amenity will also be applicable to the protection of ecological health.
		7. Emission modelling – The Licence Holder has conducted dust emission modelling for both 16,000,000 tonnes and 23,000,000 tonnes per annual period scenarios. The model showed that emissions appear to	General provisions of the <i>Environmental Protection Act 1986</i> for the prevention, control, and abatement of pollution and environmental harm still apply.
6	Two public submissions highlighted a lack of engagement and transparency		The department understands that stakeholder engagement and consultation is vital in achieving

Item	Public submission	Licence Holder's response	Department's response
	<p>from the Licence Holder, with a call for better communication and proactive measures to address community concerns.</p>	<p>be localised, posing minimal health risks and impacts to amenity at sensitive receptors. All dust improvements considered in the modelled scenario (excluding grain handling) have now been implemented.</p> <p>8. Public health and amenity – The public amenity within the Fishing Boat Harbour and the boat building precinct is subject to light industrial zoning, located within the Port Reserve. Occupational exposure monitoring for metals, silica, asbestos indicate low exposure levels and remain compliant with relevant criteria outlined by Work Safe. The Licence Holder's Dust Management Plan sets out objectives to address public amenity and nuisance dust, with dust deposition monitoring in the Fishing Boat Harbour showing improving trends since mid-2023.</p>	<p>positive outcomes for managing dust. Public submissions received have also highlighted the increased level of consultation with key stakeholders, as detailed in the Licence Holder's Dust Management Plan. As stated in the detailed risk assessment, the department expects the Licence Holder to continue engaging with key stakeholders, especially users and leaseholders of the Fishing Boat Harbour.</p>
7	<p>Three public submissions detailed suggestions to improve the management, monitoring, and reporting of dust emissions from the premises, including the use of better dust mitigation technologies and real-time dust monitoring. They also called for more proactive and holistic management of dust emissions (e.g., considering dust emissions from road and rail operations).</p>		<p>The department understands that a number of improvements have been implemented to better manage and mitigate dust emissions (as detailed in Section 3.4.4), driven by the Dust Steering Committee. Further improvements are also planned.</p> <p>Real-time monitoring is undertaken by the Licence Holder, which is used to compare to 24-hour average limits (and other relevant limits). Furthermore, the Licence Holder also operates under internal trigger levels that are based on shorter averaging periods, to more proactively manage excessive dust emissions. Condition 27 in the amended licence L4275/1982/15 was updated to include real-time PM₁₀ monitoring via the TEOM monitor at the existing monitoring locations.</p> <p>The department understands that, while the management of dust emissions from truck and rail operations beyond the premises boundary is not regulated under Part V of the EP Act, the Licence Holder has also taken measures to better manage dust emissions from these potential sources (refer to Section 3.4.4).</p>

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

Condition	Summary of Licence Holder's comment	Department's response
----	The Licence Holder noted that the assessed production/design capacity for Category 58 and 58A was still 16,000,000 tonnes per annual period and requested that it be updated to 23,000,000 tonnes per annual period.	<p>This was an administrative omission and has been amended to reflect the assessed production / design capacity of 23,000,000 tonnes per annual period (cumulative).</p> <p>No changes were made to the assessed daily production capacity, which remains at 160,000 tonnes per day (cumulative).</p>
Condition 3	<p>The Licence Holder accepts the inclusion of truck and rail unloader facilities in this condition, but requests that the requirement for the operation of dust extraction system be reverted to only apply to storage sheds for iron ore and metal concentrate.</p> <p>This was because existing storage sheds for mineral sands and garnet are not designed or equipped with dust extraction system.</p> <p>However, the Licence Holder clarified, with the transition of metal concentrate handling via Rotainer box system at Berth 6, the metal concentrate storage shed at Berth 4 is currently being utilised for the storage of mineral sands, lithium direct shipping ore, and spodumene concentrate. The dust extraction system that is installed at the metal concentrate storage shed will be in operation when the storage shed is used for the handling mineral sands, lithium direct shipping ore, and spodumene concentrate.</p>	<p>The department has accepted this change, noting that the throughput at Berth 4 will not increase significantly. Where available (i.e., storage sheds previously used for the handling of metal concentrate), the Licence Holder has committed to operating dust extraction systems.</p> <p>Amended condition 3 still applies to iron ore storage sheds as well as truck and rail unloader facilities that handle iron ore, which is the regulated bulk product that will increase by the greatest amount as a result of this licence amendment.</p>
Condition 4	<p>The Licence Holder requested the condition be modified to:</p> <ul style="list-style-type: none"> Specify adequate moisture conditioning be undertaken by product owners under condition 4(a), as the Licence Holder does not undertake any moisture conditioning. Exclude the requirement to maintain records of moisture conditioning for mineral sands, garnet, clean fill, and fertiliser under condition 4(b), as these products are shipped dry and the Licence Holder does not request or retain records of moisture 	<p>The department has accepted these changes, noting that it is ultimately the Licence Holder's responsibility to ensure there is no unacceptable risk of emissions and discharges to surrounding human health and ecological receptors.</p> <p>The department understands that no records for moisture conditioning will be available for regulated bulk granular products that are handled dry. It is expected that the Licence Holder will implement other controls and measures to manage potential dust emissions, as required under condition 4(c).</p>

Condition	Summary of Licence Holder's comment	Department's response
	content or dust extinction moisture (DEM) level from product owners.	
Condition 5	<p>The Licence Holder requested the condition be modified to:</p> <ul style="list-style-type: none"> Remove requirements for dust covers and wind shields on hoppers and grab buckets under condition 5(a). Remove condition 5(d) as spill plates and wind shields are only utilised for specific regulated bulk granular products. Include the option for vacuuming, in addition to sweeping, under condition 5(f), as vacuuming is considered more effective and generates less dust during the loading of nickel. 	<p>The department has accepted these changes, such that:</p> <ul style="list-style-type: none"> Dust covers and wind shields are only required for conveyors. Spillage may be removed via either sweeping or vacuuming. <p>The department has retained condition 5(d) as it applies only to regulated bulk granular products that are unloaded onto the premises (e.g., mineral sand concentrate, coal, fertiliser).</p>
Condition 9	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Specify 'a cascading chute' (rather than cascade chute) as the preferred terminology, as it provides flexibility for other chutes with the same technology to be utilised. Correct an administrative error associated with talc stockpile heights. Specify 'dust mitigation fence' (rather than DustTamer fence) as the preferred terminology, as it provides flexibility for other dust-mitigating fences with the same technology to be utilised. 	<p>The department has accepted these changes and corrected the relevant errors.</p>
	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Authorise loading of mineral sands, garnet, lithium direct shipping ore, spodumene concentrate, talc, and clean fill via a connected facility. 	<p>Based on further correspondence, the Licence Holder considers that the authorisation for the use of an '<i>internal hopper</i>' for product loading purposes to be adequate and does not need to be modified to specify loading through a '<i>connected facility</i>'.</p> <p>The authorisation to load mineral sands and garnet products through an internal hopper to the Berth 4 bulk handling facility has been included, consistent with handling methods that have been authorised previously.</p> <p>The department understands that the loading of talc products is currently undertaken via the common user truck unloader and is unlikely to change in the near future. Hence, the department has not assessed or authorised the loading of talc via internal hoppers or connected facilities under this licence amendment. Should talc be handled and loaded via a different method, the Licence Holder should apply to amend the licence to authorise the new</p>

Condition	Summary of Licence Holder's comment	Department's response
	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Exclude mineral sands product loading from requiring use of cascade chute, as it is not currently feasible due to risks associated with cross-contamination. The Licence Holder considers other conditions in the amended licence (e.g., condition 5) to be sufficient for managing dust emissions associated with mineral sands. 	<p>handling method.</p> <p>The department has accepted this change, noting that the throughput at Berth 4 will not increase significantly. The cascading chute is currently used for the most significant dust-generating product (i.e., garnet).</p> <p>Further, the department understands that the Licence Holder is continuing to make improvements for the use of cascading chute at the premises, including procurement of additional chute for loading of ilmenite.</p>
	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Remove requirement to maintain the DustTamer fence while there is an open talc stockpile and/or dust-generating activities is taking place. The Licence Holder noted that the DustTamer fence has currently sustained damages due to strong winds. The Licence Holder is currently working with the manufacturer to make repairs and ensure long-term integrity. Nevertheless, the Licence Holder considers that other requirements in Table 1 are sufficient to manage dust emissions from the talc stockpile during periods where the DustTamer fence may require repair. Further, real-time monitoring of PM₁₀ is undertaken upwind and downwind of the talc stockpile and DustTamer fence, where significant dust liftoff will be managed under the Dust Management Plan. 	<p>The department considers the DustTamer fence to be a critical control for the Licence Holder to mitigate dust emissions from the open talc stockpiles from impacting the amenity and health of human receptors at the Fishing Boat Harbour. In line with the department's <i>Guidance Statement: Setting Conditions</i> (DER 2015), the department considers the inclusion of the DustTamer fence, as well as the requirement to maintain its integrity and function, in the amended licence to be justified. Understanding that occasional damages to the fence may be sustained, the Licence Holder should endeavour to improve fence integrity and/or reduce potential risk of integrity failure in order to maintain compliance with this requirement.</p> <p>The Licence Holder may request the requirement be amended in the future, where the DustTamer fence is no longer required to manage dust emissions associated with the talc stockpile.</p>
	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Specify the use of the dust suppression system at Berth 5 and Berth 7 only for the loading of hematite iron ore, not magnetite iron ore, because additional water cannot be added to magnetite during shiploading due to the risk of exceeding the transport moisture limit (TML). The Licence Holder stated that the moisture level of loaded magnetite has been routinely within 1% of the TML and well above the relevant DEM level, ensuring minimal dust emissions during shiploading. <p>The Licence Holder has provided additional information, including analytical certification and summary statistics for recent iron ore product batches loaded at Berth 5 and Berth 7 to support the request.</p>	<p>Based on the information provided, as well as the Licence Holder's concerns on potentially exceeding the TML for iron ore products, the department has modified the requirement such that the dust suppression system at Berth 5 and Berth 7 must be operated where the product moisture content does not meet the relevant dust extinction moisture (DEM) levels.</p> <p>This requirement will apply to both hematite and magnetite iron ore products, noting that the use of dust suppression system will not be required by the licence for the loading of magnetite if the DEM level can be met. This requirement targets the management of iron ore products where the risk of dust generation is greatest (i.e., product moisture content is lower than the relevant DEM levels).</p>

Condition	Summary of Licence Holder's comment	Department's response
	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Specify requirement for metal concentrate and mineral sand concentrate products to be stored within Rotainers whilst on the premises to acknowledge that product may be stored in Rotainers both on and off the premises, prior to shiploading. 	<p>The department has accepted this change.</p>
	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Specify the requirement for the use of dry fog dust suppression system on vessel holds only during shiploading of lead concentrate, nickel concentrate, and iron concentrate, rather than for all metal concentrates and mineral sand concentrate products. The Licence Holder does not consider the use of the dry fog dust suppression system to be required for copper concentrate, manganese ore, zinc concentrate, or mineral sand concentrate due to the lack of trigger level exceedances associated with these products based on historical ambient air quality monitoring data. Furthermore, implementing the dust suppression system for all metal concentrate products on Berth 6 would add considerable time to shiploading, which was not accounted for in shiploading schedules and agreements. The Licence Holder considers other conditions in the amended licence (e.g., condition 4, 5, 21) to be sufficient for managing dust emissions associated with these products. 	<p>The department has accepted this change. Existing air quality monitoring data and associated trigger levels are available for these parameters and have not indicated significant risks to human health associated with these parameters.</p> <p>In the future, the department may amend the condition to require the use of dry fog dust suppression system on other products if they are detected at unacceptable concentrations in the ambient air environment.</p>
	<p>The Licence Holder requested Table 1 be modified to:</p> <ul style="list-style-type: none"> Specify requirements to utilise wind shields on hoppers during unloading of heavy mineral concentrate and spill deflector plates during fertiliser unloading. 	<p>The department has not modified the condition to include these as they have been specified under amended condition 5(d). Based on further correspondence, the Licence Holder has confirmed that the removal of condition 5(d) was no longer required.</p>
Condition 10	<p>The Licence Holder requested Table 2 be modified to:</p> <ul style="list-style-type: none"> The requirement for dust suppression on outgoing rail wagons only applied to the Berth 7 rail unloader. This is because the Berth 5 rail unloader is not equipped with dust suppression system, nor is it currently operational. Furthermore, the Berth 5 rail unloader is configured to receive product unloading via belly dumper wagons, which leaves minimal residual product on the rail wagons after unloading, compared to the dual wagon tippers at the Berth 7 rail unloader. The Licence Holder will investigate 	<p>The department has accepted these changes, noting that the Berth 5 rail unloader is configured to accept product through belly dumping, which reduces the risk of dust liftoff of residual product when leaving the premises.</p> <p>The mitigation of dust emissions during unloading activities is managed by operation of the dust extraction system at the rail unloader facilities, as required under condition 3.</p> <p>The omission of lithium direct shipping ore and spodumene concentrate for handling at the Berth 4 common user truck unloader was an administrative error</p>

Condition	Summary of Licence Holder's comment	Department's response
	<p>potential for dust suppression system at the Berth 5 rail unloader if it is recommissioned.</p> <ul style="list-style-type: none"> • Include unloading of lithium direct shipping ore and spodumene concentrate at the Berth 4 common user truck unloader. 	<p>and has been corrected.</p>
<p>Condition 20</p>	<p>The Licence Holder requested Table 3 be modified to specify gross pollutant traps (rather than HumeCeptors) as water treatment requirements prior to discharge via authorised emission points.</p> <p>This is because the Licence Holder would like flexibility to allow for other similar systems to be utilised in the future, if they are found to provide similar or better treatment performance. The HumeCeptor system is a patented stormwater treatment system.</p>	<p>The department has accepted this change.</p>
<p>Condition 29</p>	<p>The Licence Holder requested Table 7 be modified to:</p> <ul style="list-style-type: none"> • Remove TB1, FBH2, ORA2, and CS1 as monitoring locations for ambient marine water quality, as the Licence Holder considers monitoring at these locations to be over and above those required to assess impacts of the premises' operations on marine water quality. • Increase the averaging period range from \pm three days to \pm five days to allow for delays relating to poor weather conditions and/or shipping movements. • Apply Note 1 to parameters monitored via passive water samplers, as the analysis is currently non-NATA-accredited. 	<p>The department has accepted these changes, noting that the department considers the ambient water quality monitoring programs to require further refinement (refer to Section 2.3.5 and Section 3.5.4).</p> <p>Where additional information is available in the future to better inform a robust ambient water quality monitoring program, the department may decide to include these as monitoring locations through a future licence amendment.</p> <p>The averaging period range for the passive water sampler was specified as \pm three days in the PWQMSAP. While the department currently has no issues with the proposed \pm five days, the Licence Holder should carefully consider appropriate averaging period and range to ensure sample integrity is not compromised. The PWQMSAP should be updated to reflect this as well.</p>
<p>Condition 30</p>	<p>The Licence Holder requested that this condition be removed from the amended licence, as they consider the ambient water monitoring program (which will be included in the amended licence under condition 29) is a more accurate reflection of potential impacts of fertiliser unloading at Berth 6, compared to stormwater monitoring at the HumeCeptor leading to stormwater outfall SW14.</p> <p>Furthermore, the HumeCeptor is regularly pumped out to ensure discharge into the inner harbour is minimised. The Licence Holder noted that no monitoring data has been acquired in the most recent annual period as the HumeCeptor was reportedly empty during each fertiliser handling campaign.</p>	<p>While the department agrees that the monitoring of the ambient marine environment would be preferable over the monitoring of stormwater discharge at the HumeCeptor for assessing potential impacts to the receiving environment, the department noted some differences in both monitoring programs.</p> <p>No marine water monitoring location currently exists near the stormwater outfall SW14. Additionally, the current stormwater monitoring program is required to be undertaken on a campaign basis (i.e., when fertiliser unloading is occurring), while the marine water monitoring program is only undertaken on a quarterly basis. The department has also highlighted the need for the Licence Holder to further refine the design of their marine water monitoring program (refer to Section 2.3.5 and 3.5.4).</p>

Condition	Summary of Licence Holder's comment	Department's response
		Consequently, the department has retained condition 30 in the amended licence. The Licence Holder may request to remove condition 30 through a future amendment, when it can be demonstrated that the marine water monitoring program is adequate for assessing potential impacts from fertiliser unloading on the marine environment.
Condition 34	The Licence Holder specified a typographical error.	The department has corrected the error.
Condition 36	<p>The Licence Holder requested Table 10 be modified to remove the requirement to report ambient sediment and pore water monitoring limit exceedances within six weeks of the Licence Holder becoming aware of the exceedance(s), as the exceedances were already reported in the Annual Environmental Report (condition 35).</p> <p>The scheduling of the annual sediment sampling program is such that the reporting of exceedance(s) in the Annual Environmental Report would be compliant with the six-week timeframe specified in condition 36.</p>	<p>The department has accepted this change, noting that the Licence Holder has been scheduling the annual sediment sampling program in this manner for a number of years.</p> <p>Condition 35 has been amended to require the relevant information relating to exceedances be included in the Annual Environmental Report.</p>
Amendment Report		
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