
Eastern Operations 2025 Licence Amendment Summary of Dust Monitoring Data

Summary

Pilbara Ports holds a Part V *Environmental Protection Act 1986* Licence L4432/1989/14 (**L4432**) for the export of distinct bulk granular materials, namely copper concentrate and spodumene concentrate, from its Eastern Operations facility (**Premises**) at the Port of Port Hedland (**Port**). Exports of the licensed products from the Premises occurs over Port Hedland Berth 1 (**PH1**) and Berth 2 (**PH2**). Pilbara Ports is proposing to amend L4432 to remove the Dust Extraction System (**DES**) on Berth 1 Shiploader as a dust control measure.

The DES is listed as a dust control in Schedule 3 of L4432 'Infrastructure and Equipment' and was installed with the Shiploader on Berth 1 in 2001 to collect dust from three (3) transfer chutes on the boom conveyors prior to entering the telescopic chute on the shiploader. Pilbara Ports implemented a major refurbishment to the DES in 2013, which sought to address (in part) emerging issues with the performance of its ducting and suction system. Since the refurbishment, further upgrades, regular maintenance and repairs have been implemented for the DES, however, Pilbara Ports' has continued to experience issues with the infrastructure and its performance.

In response to these issues, Pilbara Ports increased focus on other dust control measures and improvement opportunities within the Premises outload circuit, including the shiploader. Since 2013, Pilbara Ports has implemented three new or improved dust controls and four other significant infrastructure upgrades, which together have improved dust mitigation in the Premise's outload circuit.

The implementation of the infrastructure and dust control upgrades has resulted in the elimination of dust from the outload circuit, by the time licenced products reach the shiploader. As a result, the DES on the shiploader is now considered a redundant dust control measure. For this reason, Pilbara Ports is proposing to amend L4432 to remove the DES on Berth 1 Shiploader as a dust control measure.

The rationale for amending L4432 to remove the DES as a dust control is outlined in Attachment 3B. This document (Attachment 8A) provides the detailed data analysis to support the rationale.

Dust Monitoring – Licence Requirement

Pilbara Ports monitors fugitive dust emissions from a monitoring network located at its Eastern Operations Premises, consisting of two High Volume Air Samplers (HVAS): the North-East HVAS (M10) and the South-East HVAS (M11) (Figure 1). L4432 requires Pilbara Ports to operate both HVAS dust monitors for a 24-hour period during each copper (Cu) or spodumene (i.e., lithium concentrate) shiploading event, as well as "one day in six" on a rolling program to establish background conditions. L4432 also sets dust monitoring and reporting requirements, including specified criteria for Reportable Events (Table 1).

Table 1: Air Quality Reportable Event Criteria for Eastern Operations L4432

REPORTABLE EVENT CRITERIA	MONITORING EQUIPMENT
24-hour average dust as PM ₁₀ > 145 µg/m ³	HVAS (M10 & M11)
24-hour average Copper in dust as PM ₁₀ > 1 µg/m ³	HVAS (M10 & M11)
24-hour average dust as PM ₁₀ ≥ 70 µg/m ³	Taplin Street real-time dust monitor

The Licence also requires monitoring of data from the Port Hedland Ambient Air Quality Monitoring Network's (**Port Hedland Network**) Taplin Street real-time dust monitor¹, which is used as a benchmark of ambient air quality within the residential areas of the West End of Port Hedland. For each Reportable Event recorded at the Taplin Street real-time dust monitor, analysis is undertaken to determine if dust levels recorded could reasonably be attributable to Pilbara Ports operations.

Dust Sources – Handling of Bulk Materials

Bulk concentrate products are currently delivered to, and handled at Pilbara Ports' Eastern Operations Premises via two methods, each of which have potential fugitive dust sources:

- **Conveyor fed ship-loader at Berth 1 (PH1).** Bulk concentrate products handled through this system are delivered to the Premises by road trains which side-tip into purpose build storage sheds, where the material is stored before shipment. The storage sheds are served by roller doors and maintained at negative pressure by an extraction system with dust bag house filtration. The sheds also have ceiling mounted sprinkler network, to ensure that fugitive dust emissions are mitigated. Concentrate is then reclaimed via a front-end loader and placed via hopper onto a conveyor within each of the sheds. The series of conveyors and transfer chutes move material along the outload circuit to the ship-loader where it is loaded into the ships hold via telescopic chute for export. Key potential dust sources for this handling method, are considered to be the storage sheds (during delivery of product via road train to site), as well as the conveyors, transfer chutes and shiploader, but only during outloading events. The DES which is the subject of this Licence amendment application, is located on the shiploader.
- **Rotating containers at Berth 1 (PH1) or Berth 2 (PH2).** Bulk concentrate products are transported to site in lidded rotating containers. These containers are either transported directly to the Berth during shiploading operations or stored in a concentrate container storage area prior to shipping. During shiploading road trains transport containers to the Berth where a crane lifts each container into the vessel's hold. The crane is fitted with an attachment which lifts the lid once the container is in the hold and then rotates the container to discharge the product. The lid is then replaced and the container removed from the vessel's hold and returned to the road train.

¹ Operational control of the Port Hedland Network was transferred from PHIC to DWER on 1 January 2022



Figure 1: Eastern Operations Dust Monitoring Network

Dust Monitoring Network – Data Review (2017 to 2025)

Pilbara Ports has examined dust monitoring data from financial year (FY) 2017-18 through to FY 2024-25.

Table 2 presents a summary of the total number of shipments of bulk material products for each financial year from the Eastern Operations Premises, and the corresponding number of 24-hour HVAS monitoring events and Reportable Events between July 2017 and June 2025 .

Table 2: Summary of HVAS Samples and Reportable Events at Eastern Operations Premises, from FY2017-18 to FY2024-25

FINANCIAL YEAR	EXPORT VOLUME (TONNES)		NO. OF SHIPMENTS		NO. OF HVAS SAMPLES TAKEN	REPORTABLE EVENTS	
	Copper (Cu)	Spodumene (Li)	Cu	Li		Cu in Dust as PM ₁₀ (µg/m ³)	Dust as PM ₁₀ (µg/m ³)
2017/18	352,338	N/A ²	30	N/A	180	4	1
2018/19	345,533	209,361	30	20	238	2	0
2019/20	358,681	300,587	35	23	215	3	5
2020/21	279,183	403,641	27	26	203	0	0
2021/22	267,946	436,935	25	19	195	0	0
2022/23	218,990	1,137,305	21	39	185	0	0
2023/24	106,979	1,287,483	12	48	160	1	3
2024/25	100,434	1,355,809	7	48	169	0	3
TOTAL	2,030,084	5,131,121	187	223	1545	10	12

During this period, 410 vessels were loaded with spodumene or copper concentrate at Eastern Operations: Berth 1 (**PH1**) and Berth 2 (**PH2**).

Over the eight years of data analysed, there were a total of 22 Reportable Events from a total of 1,545 24-hour HVAS sampling events (1.42% of the total samples). Of these samples:

- 12 were above the Reportable Event criteria for dust as PM₁₀ of 145 µg/m³; and
- 10 were above the Reportable Event criteria for Cu in dust as PM₁₀ of 1 µg/m³ (as a 24-hour average).

The number of Reportable Events has decreased significantly since 2020, with 15 Reportable Events between FY 2017-18 and FY 2020-21, and only seven (7) in the last five financial years.

² The export of bulk spodumene concentrate commenced at Eastern Operations Premises in FY2018/19. Prior to this, bulk spodumene concentrate was exported from Pilbara Ports' Utah Point Premises (L8937/2015/1).

ATTACHMENT 8A SUMMARY OF DUST MONITORING DATA



Reportable Events that occurred during this period were analysed further to investigate dust levels associated with the handling of concentrate along the outload circuit at PH1 specifically, as this is where the DES is located. This data is most relevant to this Licence amendment application as it illustrates where dust emissions exceeded licence thresholds during outloading operations at PH1 and are an indicator of the effectiveness of dust controls along this outload circuit.

Of the 22 Reportable Events that occurred between 2017 and 2025, only nine (9) of these correlate to a shipment on PH1 (highlighted green in Table 2). All of the Reportable Events for PH1 have also only occurred during copper outloading events, with no Reportable Events for dust as PM₁₀ occurring during outloading of spodumene concentrate.

Table 1: Reportable Events recorded at Eastern Operations Premises and correlating shipments from PH1, from FY2017-18 to FY2024-25

REPORTABLE EVENT				CORRELATING SHIPMENT AT PH1
DATE OF SAMPLE	MONITOR LOCATION	Copper (µg/m³)	Dust as PM10 (µg/m³)	
24/7/2017	M10	1.3		Copper
19/10/2017	M10	1.1		Copper
16/12/2017	M11		186	No shipment at PH1
18/4/2018	M10	1.5		Copper
2/5/2018	M10	1.7		Copper
6/9/2018	M10	1.2		Copper
5/11/2018	M10	1		Copper
23/7/2019	M10	1.5		Copper
21/8/2019	M10		160	No shipment at PH1
30/11/2019	M10		350	No shipment at PH1
30/11/2019	M11		350	No shipment at PH1
8/12/2019	M10	2.1		Copper
9/12/2019	M11	3.7		Copper
12/12/2019	M10		250	No shipment at PH1
12/12/2019	M11		240	No shipment at PH1
30/8/2023	M10	1.1		Copper
18/10/2023	M11		190	No shipment at PH1
8/1/2024	M10		280	No shipment at PH1
8/1/2024	M11		340	No shipment at PH1
10/10/2024	M11		150	No shipment at PH1

REPORTABLE EVENT				CORRELATING SHIPMENT AT PH1
DATE OF SAMPLE	MONITOR LOCATION	Copper ($\mu\text{g}/\text{m}^3$)	Dust as PM10 ($\mu\text{g}/\text{m}^3$)	
27/12/2024	M11		150	No shipment at PH1
31/1/2025	M11		150	No shipment at PH1

These results show a significant decrease in dust emissions during outloading events at PH1 since 2020, with nine (9) events occurring between 2017 and 2019, and only one (1) event since 2020. This data is also illustrated in Figure 2. Overall, the data indicates that the current dust controls that are in place for the PH1 shiploader and associated bulk concentrate handling and storage infrastructure are effectively mitigating dust emissions.

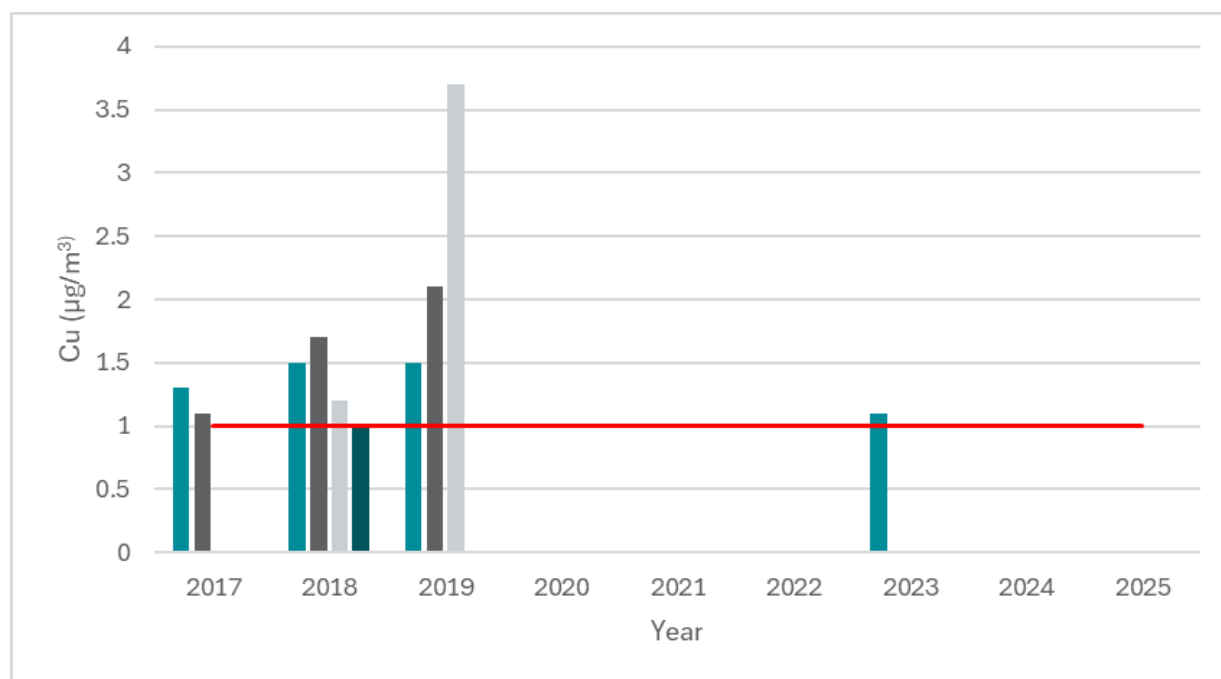


Figure 2: Number of Reportable Events for Copper ($\mu\text{g}/\text{m}^3$) at Eastern Operations Premises during shipments from PH1, from FY2017-18 to FY2024-25

Product Moisture Monitoring – Data Review (2020 to 2025)

It is important to note that, in addition to the dust control infrastructure, dust emissions are also managed through the monitoring and tracking of product moisture levels against their respective Dust Extinction Moisture (DEM) levels. Analysis of moisture data between 1 July 2020 – 30 June 2025 indicates that 99.97% of spodumene and copper concentrate transported to site and 100% of distinct bulk granular materials shipped from site were at or above the products' respective DEMs since July 2020.