
Eastern Operations 2025 Licence Amendment Proposed Activities

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' (Figure 1) 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 licensed products reach the shiploader. As a result, the DES on the shiploader is now considered a redundant dust control measure.

EXISTING DUST CONTROL INFRASTRUCTURE – AS LISTED IN L4432

Schedule 3 of L4432 lists a range of dust control infrastructure and operational requirements which are currently in place for the Premises, including the concentrate storage sheds, conveyors, transfer chutes and shiploader.

The dust controls currently implemented under L4432 for the Premises are summarised in Table 1.

Table 1: Summary of Dust Controls (taken from Schedule 3 of L4432)

SITE INFRASTRUCTURE	DUST CONTROL
Storage Sheds	Shed doors closed Dust Extraction System Operational bag house system Sprinkler System
Conveyors	Dust covers Skirts Side guards Belly pans Spray bars Fully sealed rubber covers at tail end of CV01 and MC02 (now all conveyors (except CV05/06 transfer))
Transfer Chutes and Shiploader	Dust shrouds/covers Dust extraction system Blocked head chute sensors on telescopic chute

The controls for each conveyor are further specified in Schedule 3 (an excerpt is provided below in Figure 2).

Dust Extraction System

The DES was installed at the Premises in 2001, with the Shiploader on Berth 1. The purpose of the DES is to extract dust at three transfer chutes which approach the shiploader and telescopic chute, specifically as product is transferred from conveyors CV04 to CV03, CV03 to CV02 and CV02 to CV01 (Figures 3 & 4).

The DES operates automatically through Pilbara Ports' CITEC system and works by creating a negative pressure at the 3 extraction points, forcing dust particles into the system. The dust then collects on the housed filtration system which is set to pulsate high pressure blasts of air into the filters at set intervals. The pulsating air removes the now built-up dust that has collected on the filters which then drops into the lower section of the hopper. The lower section of the hopper has a rotary valve which rotates at set intervals, emptying the material into an open skip bin that gets forklifted on and off the shiploader to be emptied.

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. Several components of the DES were replaced during a refurbishment in 2013, including installation of a new compressor, platform and parts of the ducting 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. More recently, planned maintenance inspections have identified a build-up of foreign material and corrosion inside the pivot tube – the main supporting beam for the shuttlerail, where the ducting for the DES runs directly through. The buildup inside this pivot tube is currently restricting the air flow of the circuit limiting the functionality of the DES, and the corrosion also poses a risk to the structural integrity of the pivot tube and shuttlerail.

Conveyor	Dust Cover ¹	Skirts	Side guards	Belly pan
BC01	*	*		*
BC21	*	*		*
BC02	*	*		*
BC03	*	*		*
CV01	*			*
CV02	* partial	*		*
CV03	* fully enclosed			*
CV04	* partial		wind guards	* stainless all the way to the hood
CV05			wind guards	* sealed
CV06	* partial		*	*
CV07	*			*
CV09	*			* partial
CV10	* partial	* partial	* partial	* partial stainless
MC01	*	*		* stainless
MC02	*	*		*
CV12	Fully enclosed with metal cowling on both sides			
BC04	Fully enclosed with metal cowling on both sides			

¹ Dust covers include perspex, plastic, canvas and/or stainless-steel covers.

Figure 1: L4432/1989/14 Schedule 3 Excerpt – Dust Extraction

Description	Operation requirement
The dust extraction system (DES) contains 12 dust/air filters.	DES automatically activated via the CITEC automated control system prior to the outload circuit starting up. This enables extraction of dust arising from the product when transferred between CV02 and CV01 and between CV03 and CV02. DES failure sends a signal to the CITEC automated control system and causes the outload circuit to stop running. DES dust/air filters changed out as required.
DES automatic filter clean,	The DES has a vacuum sensing system which causes dust collected in the filters to be disposed of in a spill bin below. It is emptied and cleaned after each shipment.

Figure 2: L4432/1989/14 Schedule 3 Excerpt – Conveyor Dust Controls



Figure 3: Shiploader on Berth 1 at the Premises (L4432)

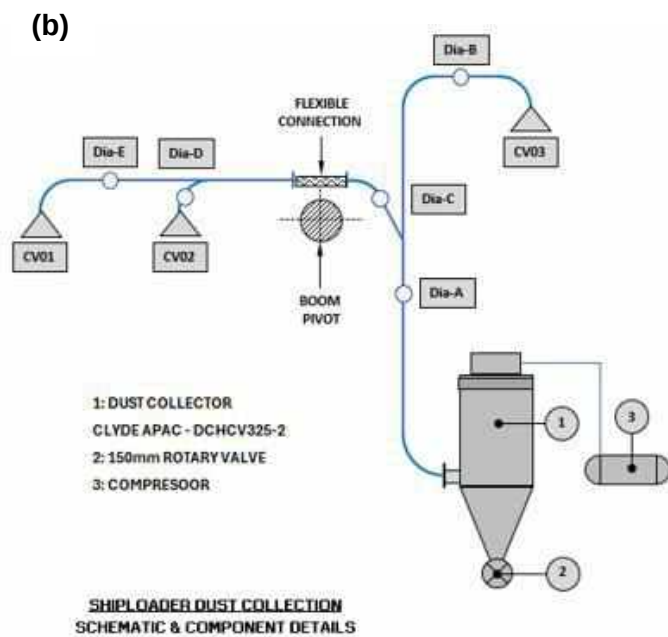


Figure 4: (a) Dust Extraction System; and (b) Process Flow / Schematic Diagram for the Dust Extraction System

DUST CONTROL UPGRADES SINCE 2020

In response to these ongoing issues with the DES, Pilbara Ports has invested in upgrades which have served to either improve the effectiveness of existing dust control measures or introduce new dust controls along the outload circuit, including the shiploader. In addition to the dust controls measures outlined in L4432, there have been three (3) new or improved controls and four (4) other significant infrastructure upgrades since 2020 (photos of these components are provided in Attachment 5-0).

Pilbara Ports has implemented the following new or improved dust controls in the Premises out-load circuit, which have resulted in improvements to dust management:

1. **Conveyor Skirt Module Upgrades:** Conveyor skirt modules have been replaced on 3 conveyors (CV01, CV02 and CV03). These modules help guide the product to stay on the conveyor belt and span the entire length of the belts from the head to tail chutes. The module upgrades included:
 - Installation of skirting rubbers at transfer points (CV01/02, CV02/03, CV02/03). These stop dust escaping as it falls onto the next conveyor belt.
 - Installation of new skirt module top covers at CV02 and CV03. These are designed to completely seal the top and stop dust escaping from that location.
 - Installation of adjustable Tivar hard skirts along CV01, CV02 and CV03. These close the gap and stops dust escaping as it travels along the conveyor.
2. **New sealed telescopic chute:** The new telescopic chute was fabricated out of stainless steel instead of mild steel which has better slip properties allowing better flow of ore through the chute. This has stopped product from sticking to the sides of the chute, and blocking up causing spillages. The new chute was also designed with evenly balanced and weighted chute segments optimising the operation to allow full extension of the chute. This has enabled the chute to be lowered further into the vessel's hold, reducing the height of unhoused free-falling product and lowering dust emissions.
3. **Conveyor Tail End Upgrades:** Fully sealed rubber covers have been installed at the tail end of all 10 conveyors within the outload circuit. Prior to this, fully sealed rubber covers were only installed on CV07 and MC02.

Pilbara Ports has implemented the following significant upgrades to the Premises out-load circuit, which have resulted in improvements to dust management:

1. **CV02 Tail Chute:** CV02 tail chute was replaced, which has reduced the number of holes and gaps where dust was escaping from the older infrastructure.
2. **Additional Dust Suppression Sprays:** New dust suppression spray bars have been installed on 12 conveyors. These are used to even moisture content through the product when required.
3. **Belly Pan Upgrade:** Belly pans were upgraded to stainless steel along 3 conveyors, reducing the number of holes and gaps where dust was escaping from the older infrastructure. The belly pans capture any product spillage and washdown water from conveyor clean downs.
4. **Conveyor PVC Covers:** New PVC covers were installed along the outside of the conveyors. These are made from a more durable material than the previous skirts and are designed to stop dust from escaping as it travels along the conveyor.

PROPOSED LICENCE AMENDMENT

With the new dust controls and infrastructure upgrades implemented by Pilbara Ports for the outload circuit at the Premises, the result has been that by the time the product gets to the shiploader, dust has virtually been eliminated, making the DES on the shiploader a redundant dust control measure. For this reason, Pilbara Ports is proposing to amend L4432 to remove the Dust Extraction System (**DES**) on Berth 1 Shiploader as a dust control measure. Specifically, Pilbara Ports request that the DES is removed as a dust control from Schedule 3 of L4432 'Infrastructure and Equipment'.

The rationale for amending L4432 to remove the DES as a dust control is summarised below.

Dust Monitoring

Dust monitoring data from the two High Volume Air Samplers (**HVAS**) at Eastern Harbour has been analysed to determine the effectiveness of dust controls whilst outloading at Berth 1. This analysis shows that there has been a significant decrease in dust emissions during outloading events at PH1 since 2020, with eight (8) events occurring between 2017 and 2019, and only one (1) event since 2020. The detailed data analysis is provided as Attachment 8A.

This illustrates that the current dust controls for the PH1 shiploader and associated bulk concentrate handling and storage infrastructure are successful in mitigating potential dust emissions.

Management of Product Moisture

Product moisture management is considered to be a critical control to ensure dust is eliminated from the source. Pilbara Ports continues to monitor and track moisture levels of products against their respective Dust Extinction Moisture (**DEM**) levels for all products handled at the Premises. Analysis of moisture data between 1 July 2020 – 30 June 2025 indicates that 99.7% of spodumene and copper concentrate transported to site and 100% of bulk materials shipped from site were at or above the products' respective DEMs over the last five financial years.

Dust Modelling

As part of the 2022 application package for the amendment to L4432/1989/14 from 1.17 million tonnes per annum (**MTPA**) to 2.56 MTPA, Pilbara Ports undertook and submitted to DWER both noise and dust modelling. The models were not updated in support of this application as:

- Pilbara Ports is not proposing any change in the approved throughput of this facility as part of the application; and as such the dust and noise emissions are not expected to increase;
- The DES is located on the shiploader in an area within the premises boundary away from the nearest sensitive receptor being the residential areas of the west end of the Town of Port Hedland, and as such are not expected to impact on emissions at the sensitive receptor; and
- An emission factor for modelling of improvement or redundant controls cannot be determined or predicted.

Assessment of Facility Controls Against Best Practice

In 2022, a preliminary review of Pilbara Ports' Eastern Operations facility was undertaken against DWER's (Draft) Best Practice Guidelines (SLR for DWER, 2021) to understand its status and effectiveness of controls, for which they were found to be at or near best practice (Katestone, 2022; ETA, 2022). As part of this current Licence amendment application, Pilbara Ports updated this review to include the abovementioned improved controls for 'Conveyor/transfer points/chutes' and 'Shiploading' methods, which were also found to be at or near best practice. Certain areas of the conveyor system cannot be fully enclosed as they are considered critical areas/inspection points. Examples of these critical points include:

- Weightometer for inspection of product
- Magnetometer for metal on belt detections
- Sample station to assess product moisture levels.

An excerpt from the (draft) Self-Assessment Tool on the conveyor and shiploading handling methods is shown in Figure 5 below, with Pilbara Ports current controls at its Eastern Operations Facility highlighted in green.

Emission Source	Hierarchy of Control Level		Mitigation Measure	Control Effectiveness	Relative Control Effectiveness (by individual measure)	Best Practice Determination
Conveyors/ transfer points/ chutes	Elimination		C1 Minimise number of transfer points	100% per transfer point avoided	H	This is a high standard of control
	Engineering	Containment	C2 Design for material properties	Not Quantified	H	
			C3 Minimise vertical fall distance	Not Quantified	M	
			C4 Feed material to centre of belt	Not Quantified	L	
			C5 Maintain good belt alignment	Not Quantified	L	
			C6 Enclosure of transfer points	70%	M	
			C7 Belt cleaning and spillage minimisation	94%	L	
			C8 Conveyors - wind shielding - roof OR side wall	40%	H	
			C9 Conveyors - wind shielding - roof AND side wall	70%		
			C10 Dry Fog	90%		
	Suppression	C11 Water sprays	50%	L		
Best Practice C1+C2+C6+C7+C8+C10						
Ship Loading	Engineering	Containment	J1 Minimise vertical fall distance	Not Quantified	M	This is a medium standard of control
			J2 Shrouding of discharge point	Not Quantified	M	
			J3 Ship-to-shore container handlers with a rotating spreader (not applicable for iron ore)	Not Quantified		
		Suppression	J4 Dry fog/fog blanket	90%		
	Best Practice J1+J2+J4					

Figure 5: Assessment of Facility Controls for conveyor and shiploading methods at Eastern Operations against DWER's Draft Self-Assessment Tool

This provides a visual demonstration of the effectiveness of current and improved controls, and that the site presents a low risk in relation to fugitive dust emissions.

Other Administrative Updates

In addition to the removal of the DES from the Licence, there are other administrative updates that can be made in response to the above-mentioned dust control upgrades. These include:

- An update to the conveyor dust control table (changes are shown in red in Figure 6).
- Updates to the operational requirements of the conveyors to include the following additional points:
 - o Maintain fully sealed rubber covers at the tail end of all conveyors (except CV 05/06).
 - o Conveyors inspected by Licence Holder at least every 12 hours during outload.

Conveyor	Dust Cover	Canvas Skirts	Side guards	Belly Pan
BC01	•	•		•
BC21	•	•		• stainless
BC02	•	•		•
BC03	•	•		•
CV01	•	• <u>partial</u>		• stainless
CV02	• partial	•		• stainless
CV03	• <u>fully enclosed</u>			• <u>stainless</u>
CV04	• partial		Wind guards	• stainless all the way to the hood
CV05			Wind guards	• <u>stainless</u>
CV06	•partial		•	•
CV07	•			•
CV09	•	• <u>partial</u>		•partial
CV10	•partial	•partial	• partial	• partial stainless
MC01	•	•		•stainless
MC02	•	•		•
CV12	Fully enclosed with metal cowling on both sides			
BC04	Fully enclosed with metal cowling on both sides			

Figure 6: L4432/1989/14 Schedule 3 Excerpt – Conveyor Dust Controls