Permit Number: - EPR/WP3931SD

End of Year Report 2024

Table of Contents

1 – Introduction

1.1 – General Introduction

This document represents Kennametal Manufacturing UK Ltd.’s performance report for the calendar year 2024 and has been compiled in line with the conditions set out in section 4.2.1 of the site’s environmental Permit EPR/WP3931SD.

2 – Environmental Setting

2.1 – Site Location

The installation is located at Lake Road, Leeway Industrial Estate, Newport, Gwent. The centre of the site is at National Grid reference ST 343 860. The site covers an area of approximately 1 Ha.

Kennametal Manufacturing UK Ltd. is located on Leeway industrial Estate which is an industrialised area south of Newport City Centre. The site comprises of two buildings (east building and west building) separated by Lake Road. Immediately to the north is a used car dealership, Owens Distribution (haulage) and a Volvo garage. To the east of the site boundary are Yummies Fast Food Supplies, JSG Self Storage and Deflecto (plastic fabricators). To the west of the site is Wild Water Group (temperature-controlled storage). Immediately to the south of the site are Mechanica Ltd (mechanic) and MCL Logistics (haulage). It is considered that none of these operations have the potential to cause pollution to the Kennametal Manufacturing UK Ltd site.

2.2 – Details of Installation

Kennametal Manufacturing UK Ltd. are producers of boron nitride and titanium diboride ceramic materials, these activities are included in the EPR (England & Wales) 2016 regulations. Both of these materials are produced by high temperature carbothermic reduction processes.

The other activities on site are non-listed activities these are pre-treatments of the raw materials in the powder production area. Size reduction and classification of ceramic powders to produce final products for customers, the boron nitride powder is also treated in order to form specialist grades. Manufacture of water-based ceramic coatings, hot pressed ceramic billets and machining of shapes are also non listed activities carried out on site.
A site report has been submitted as part of the application to operate under the Pollution prevention and Control Regulations 2000. The report concluded that there was little likelihood of land pollution from the installation.

The nearest surface water course to the factory is ‘Julian’s’ reen which lies approximately 1km to the east of the site. The nearest major watercourse is the river ’Usk’ estuary, which lies approximately 3km to the south-west of the site at its nearest point.

The site lies on an indicative flood plain, however, there have been no recorded instances of flooding at the site.

3.1 - Monitoring Data

Emissions monitoring via a third-party contractor is conducted at the designated release points on a quarterly basis. The results for 2024 are tabled below. All of the monitoring results in 2024 were below the respective emission limit values (ELVs).

Table 3.1 Emissions Monitoring Results for 204

			2024				2024	
			Q1	Q2	Q3	Q4		
Emission Point Reference	Substance to be Monitored	Emission Limit Value (mg/m3)	Periodic Monitoring Result (mg/m3)	Periodic Monitoring Result (mg/m3)	Periodic Monitoring Result (mg/m3)	Periodic Monitoring Result (mg/m3)	Average Result (mg/m3)	Total (mg/m3)
A1 BN Furnaces Stack	Particulates	25	2.90	0.42	2.8	1.35	1.87	7.47
	Ammonia	30	4.04	11.4	21	15	73.11	292.44
	Carbon Monoxide	200	152	105	148	136	135.25	541.00
	NOx	100	36	14.6	72	75	49.40	197.60
	Sulphur Dioxide	20	3.15	2.99	2.2	4.9	3.31	13.24
	Total Cyanide	**	13.6	5.7	0.72	0.02	5.01	20.04
A3 BN New Jet Mill	Particulates	5	0.65	1.10	1.64	1.51	1.23	4.90
A6 No2 BN Oven Wet Scrubber	Particulates	25	0.93	0.55	7.4	4.81	3.42	13.69
A7 TiB2 Mill (Old Jet Mill)	Particulates	5	0.61	0.46	0.71	1.37	0.79	3.15
A8 TiB2 Firing Stack	Particulates	25	-	-	-	-	-	-
	Ammonia	30	-	-	-	-	-	-
	Carbon Monoxide	100	-	-	-	-	-	-
	NOx	100	-	-	-	-	-	-
	Sulphur Dioxide	20	-	-	-	-	-	-
	Total Cyanide	**	-	-	-	-	-	-

** Currently no limit agreed
- No monitoring data. TiB2 firing operations for emissions at point A8 was operated periodically in calendar year 2024 and production in this area was not taking place during the emissions testing dates.

ELV Exceeded

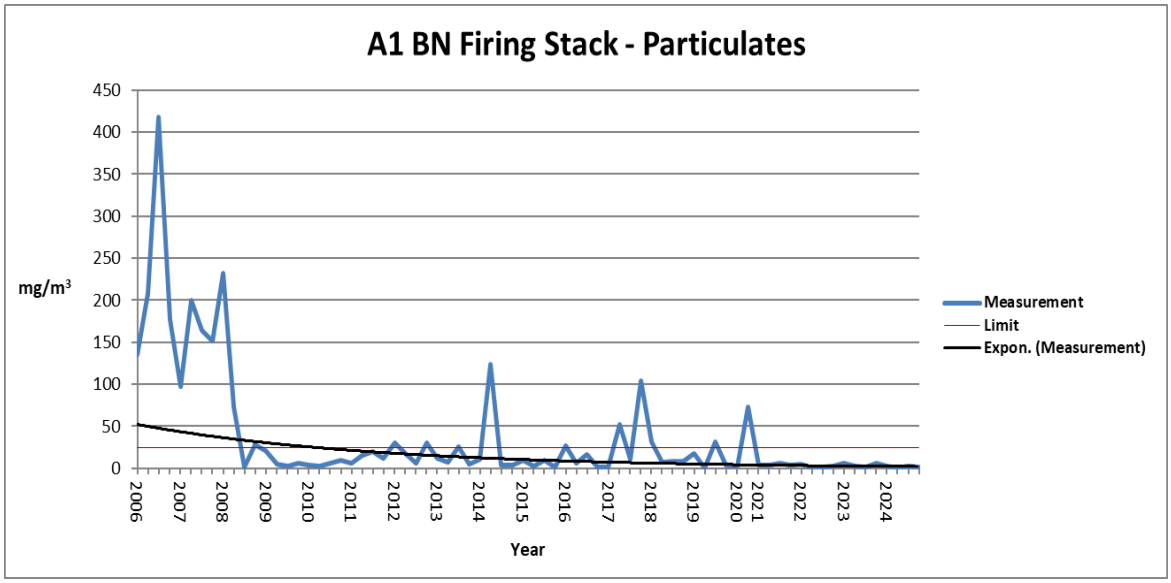
Emission Point A1 – BN Furnaces Exhaust Stack

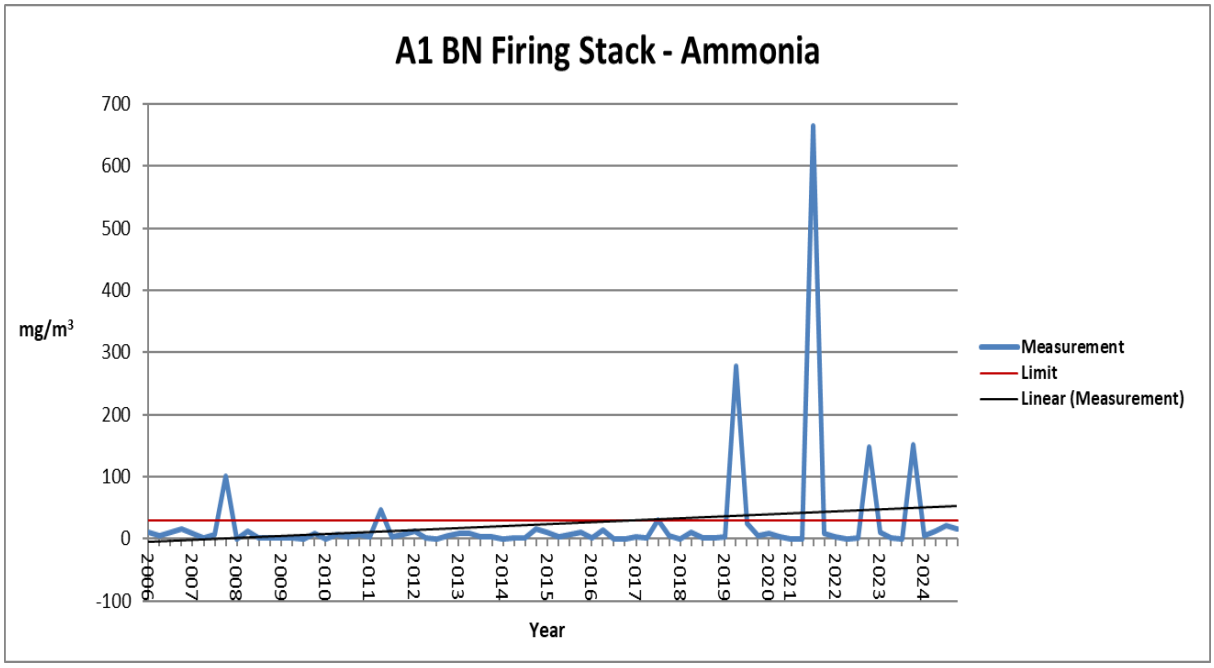
All of the monitoring results for this emission point were below the respective ELVs in calendar year 2024.

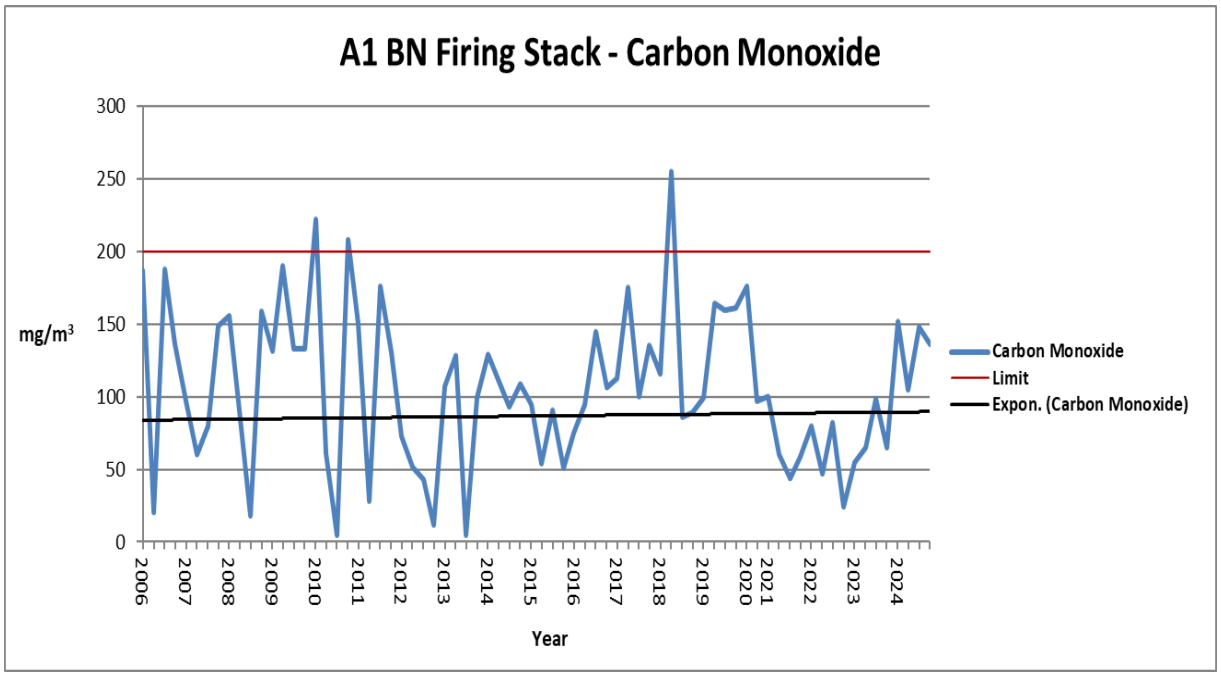
There remains a long-term downward trend for particulates (figure 3.1). There is a long-term upward trend for oxides of nitrogen but still below the ELV. A downward trend for cyanide was noted in 2024 compared to 2023 (figure 3.1). Ammonia limit breaches were experienced in 2019, 2021, 2022, and 2023 but a downward trend was noted in 2024 (figure 3.1).

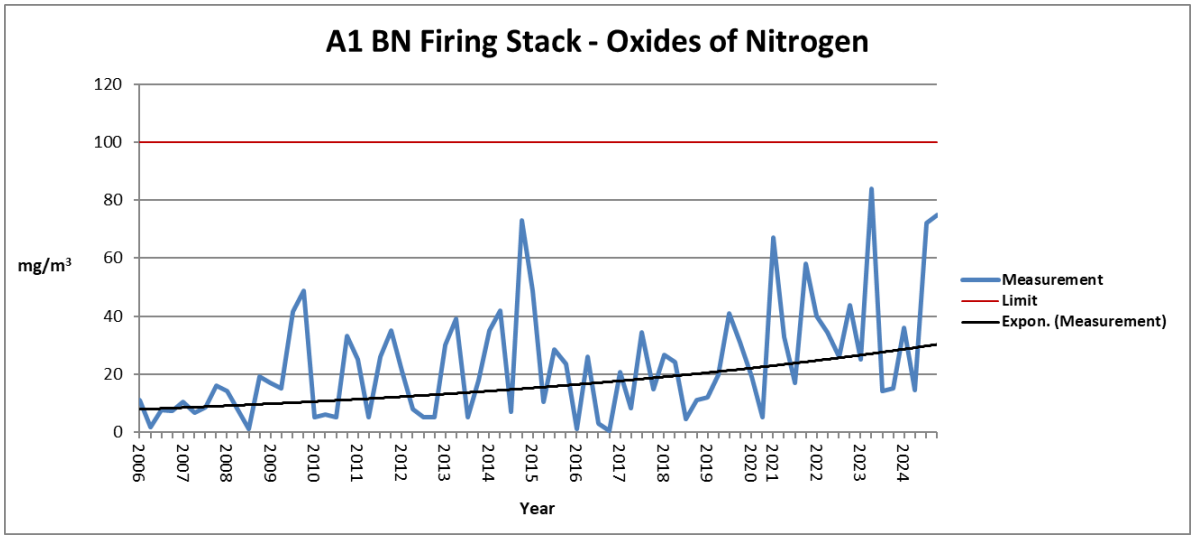
The general downward trend for particulate is due to improvements in the abatement equipment and its maintenance which has occurred over time. The mix of downward and upward trends for concentrations of gas emissions is likely to be due to the increase in throughput and/or changes to firing temperatures that have occurred over the years, as the firing process has evolved. The complex nature of the chemical reactions occurring within the firing vessels makes it difficult to know exactly why different trends are being observed for the different gases. The downward trend in 2024 for ammonia can be credited to the implementation of maintenance standard operating procedure and modification of the afterburner lance to function properly.

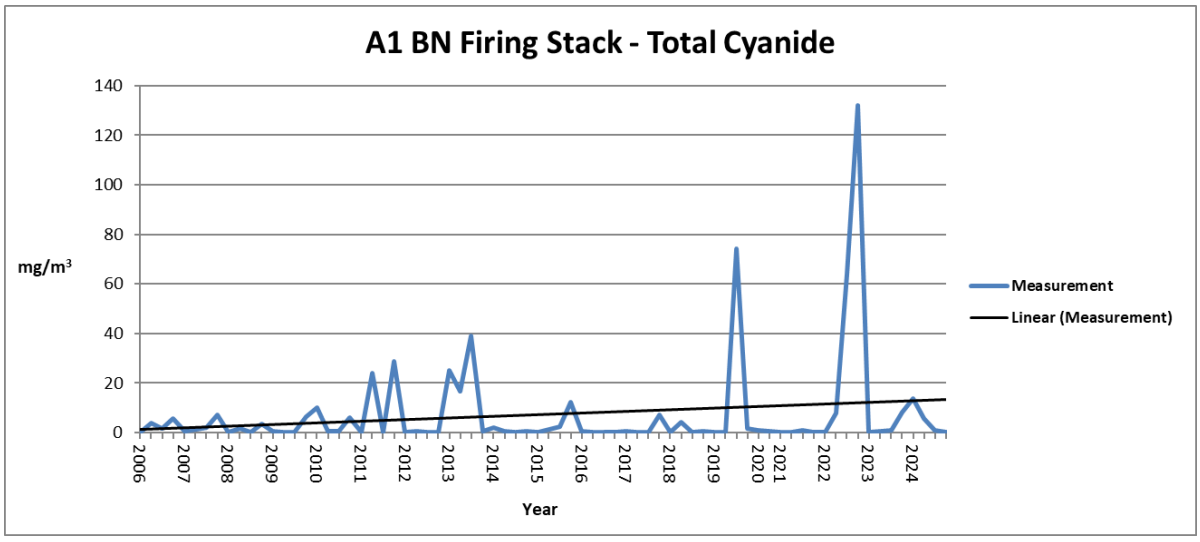
Figure 3.1




A1 BN Firing Stack - Ammonia
mg/m³
700
600
500
400
300
200
100
0
-100
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Measurement
Limit
Linear (Measurement)


A1 BN Firing Stack - Carbon Monoxide
mg/m³
300
250
200
150
100
50
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Carbon Monoxide
Limit
Expon. (Carbon Monoxide)





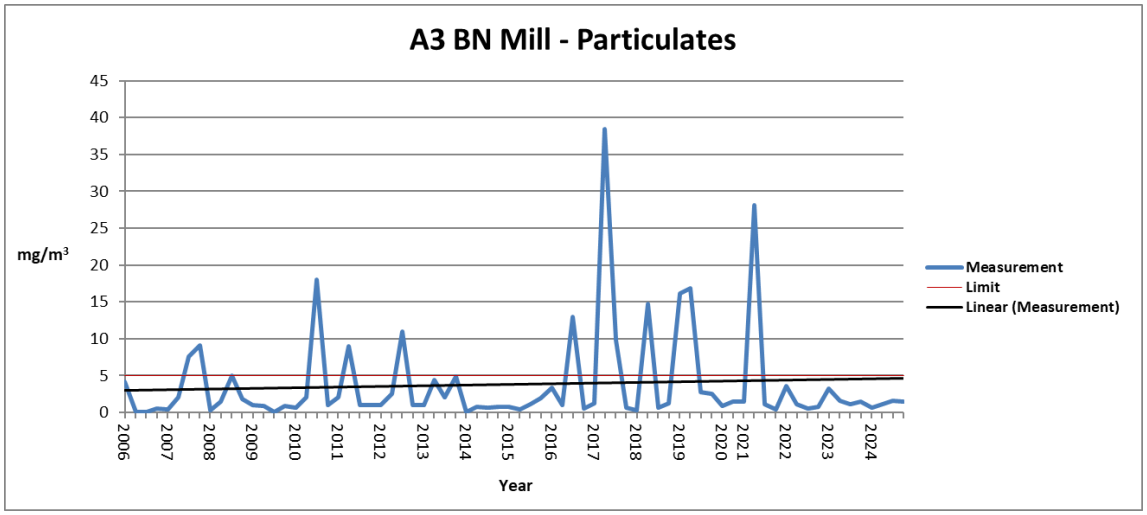
Emission Point A2

This emission point has not been in use since the third quarter of 2011.

Emission Point A3 – BN Jet Mill

There is a long-term upwards trend for this emission point (figure 3.2) although the short-term trend is downwards, and all measurements taken in 2024 were below the limit.

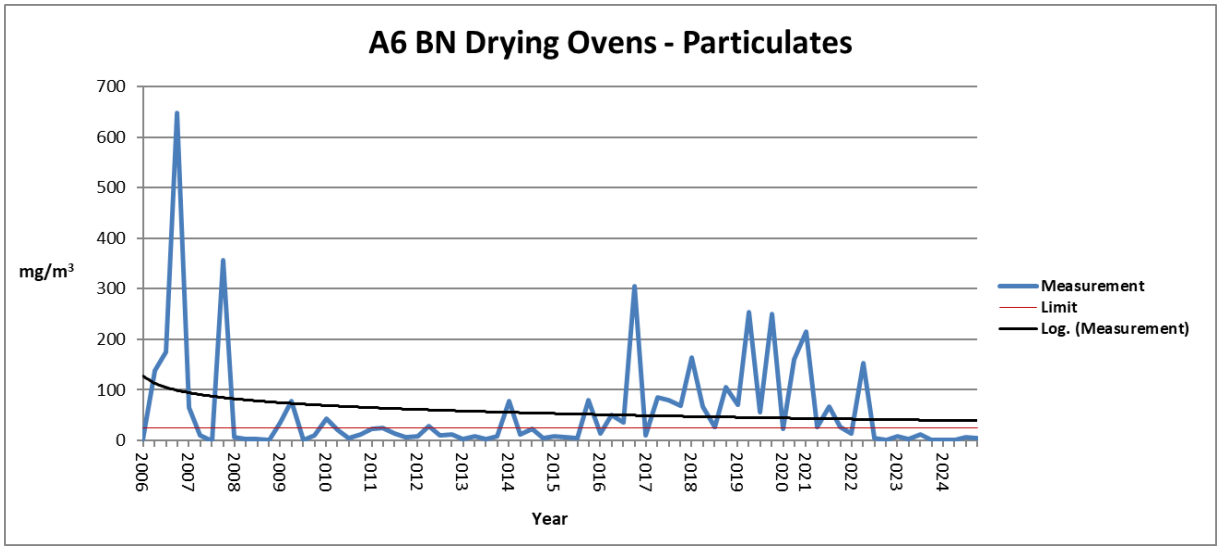
Figure 3.2



Emission Point A6 – BN Drying Ovens

A new wet scrubber abatement system was installed in August 2022 at this emission point due to frequent limit breaches occurring in recent years. This system continues to effectively remove the particulate emitted from the process. All results in 2024 were significantly lower than those experienced in previous years and comfortably below the limit with an average result of 3.42 mg/m^3 for the year. This has therefore resulted in a downtrend (figure 3.3) in particulate emissions.

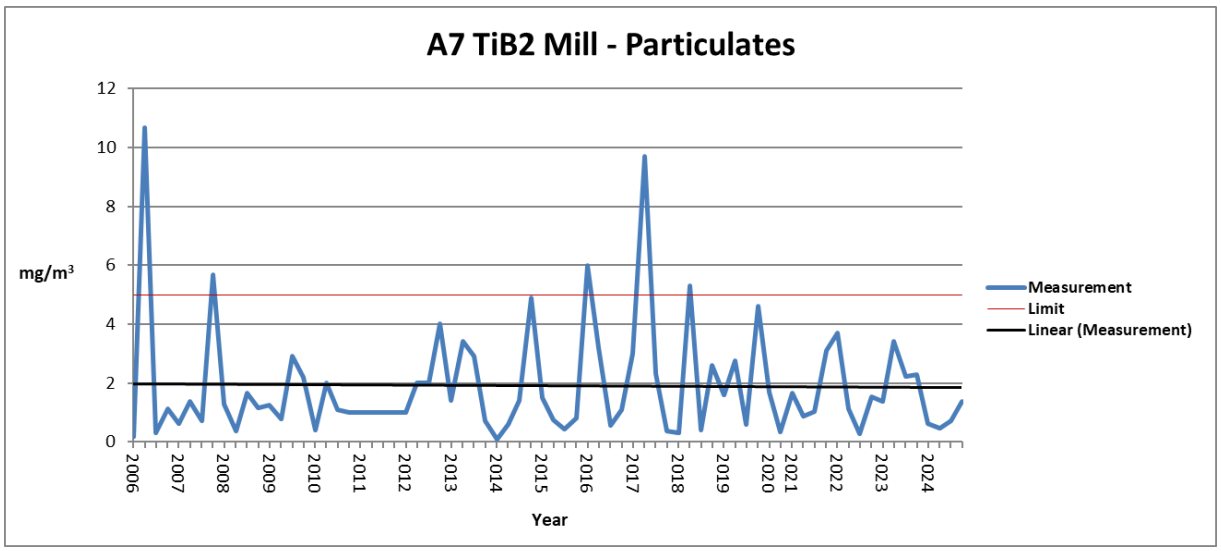
Figure 3.3



Emission Point A7 – Tib_2 Jet Mill

The measured particulate at this emission point was consistently below the ELV during all monitoring periods in 2024.

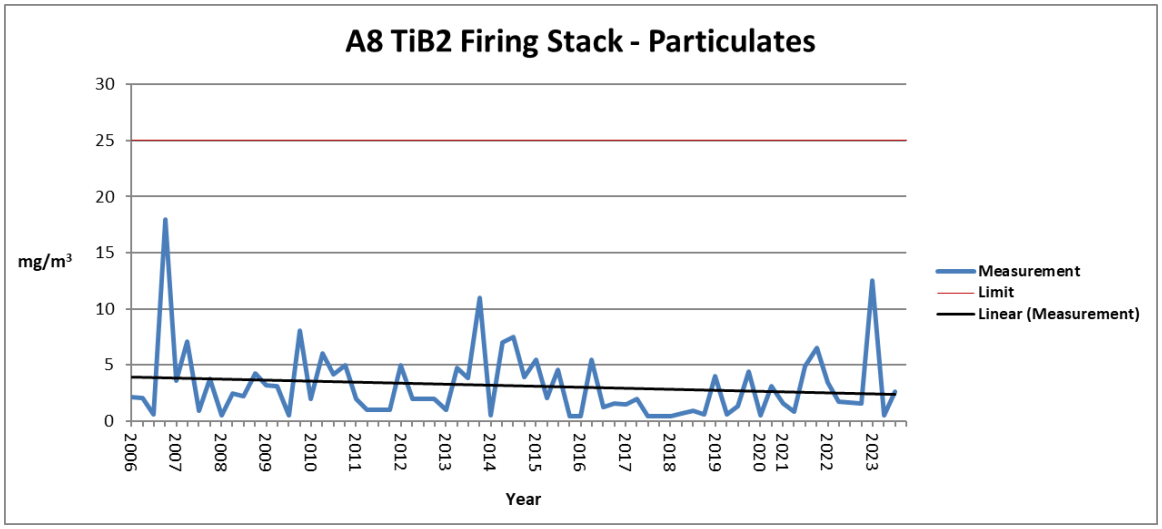
Figure 3.4

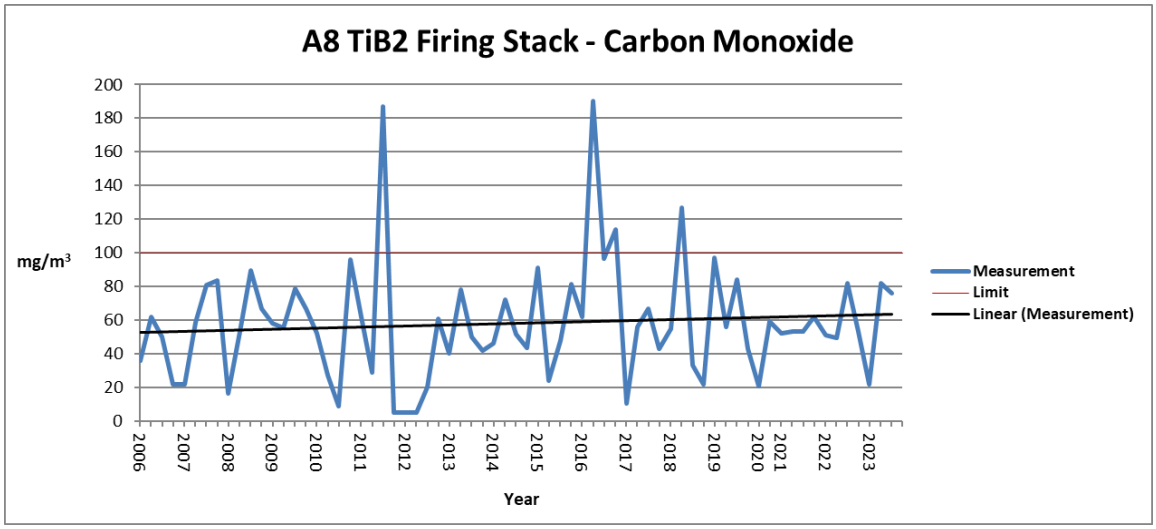


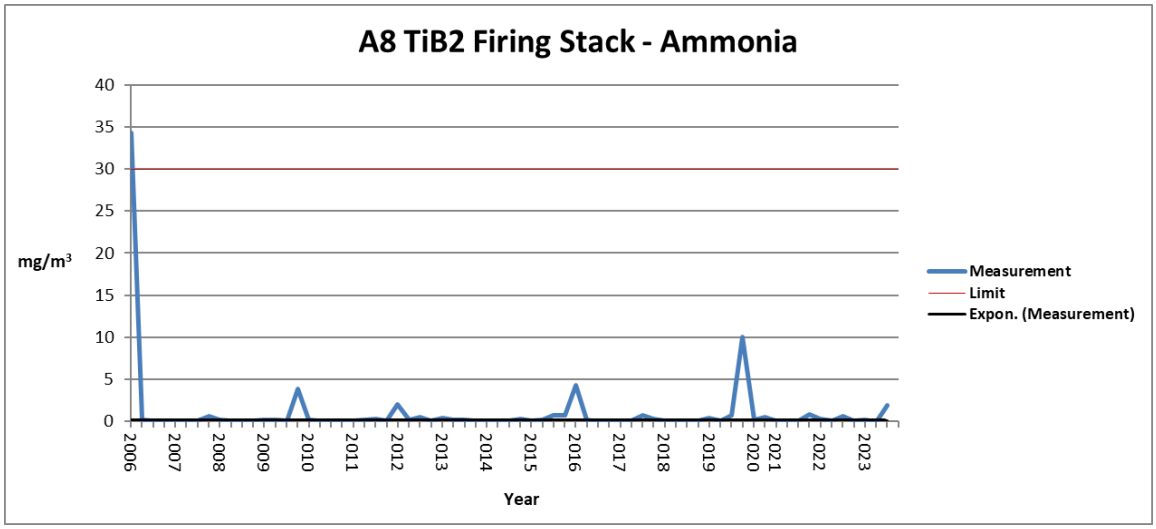
Emission Point A8

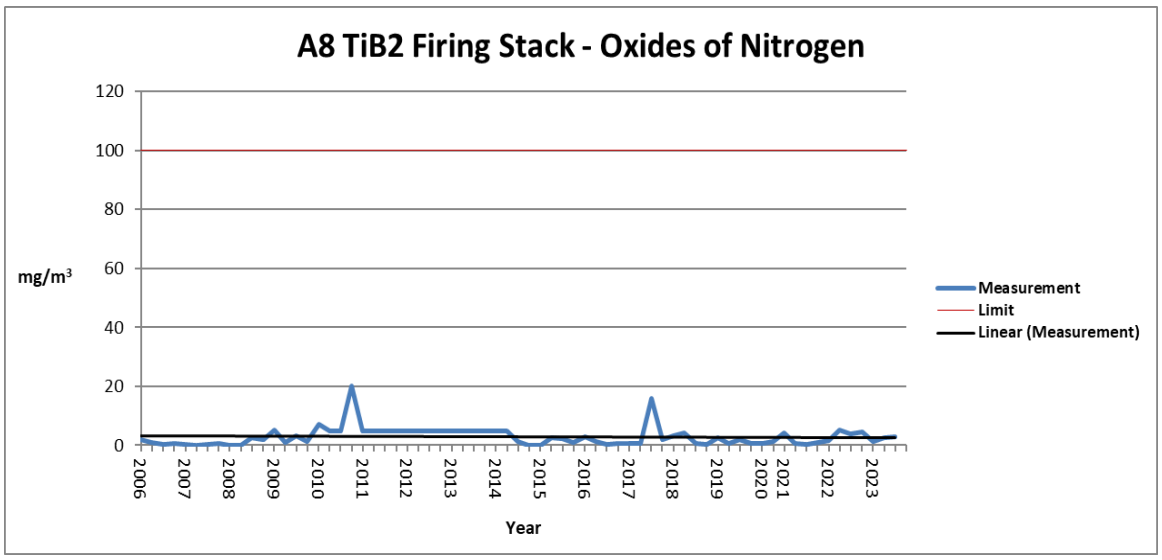
No monitoring was carried out in calendar year 2024. The TiB2 firing operations responsible for the emission at point A8 was operated periodically in 2024.

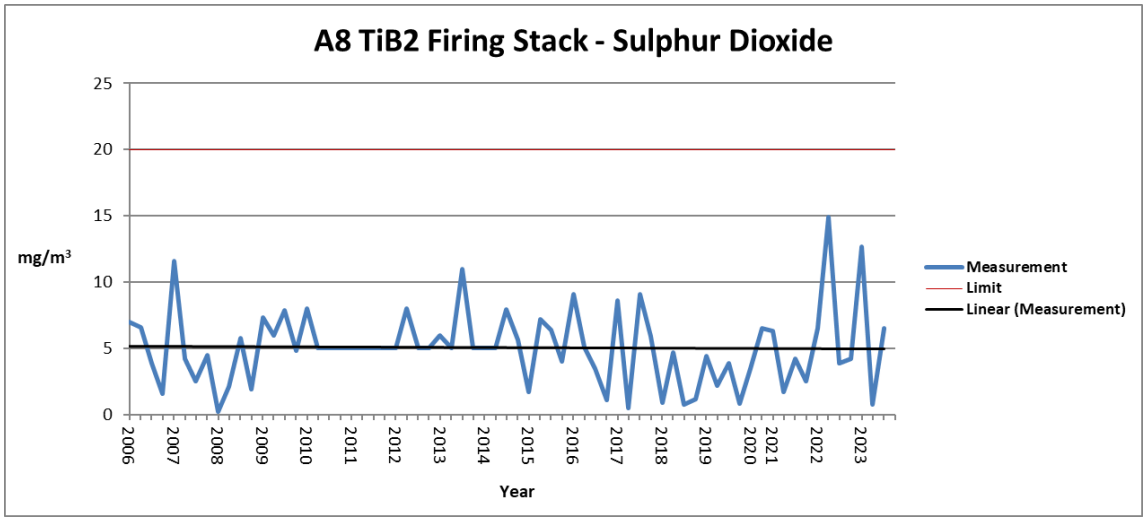
Figure 3.5

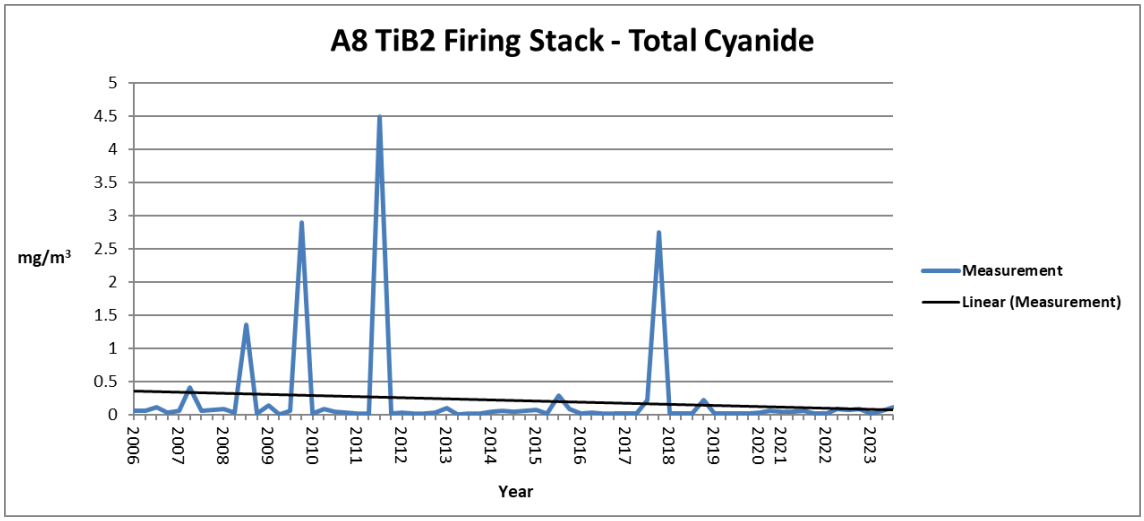



A8 TiB2 Firing Stack - Carbon Monoxide
mg/m³
200
180
160
140
120
100
80
60
40
20
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year
Measurement
Limit
Linear (Measurement)


A8 TiB2 Firing Stack - Ammonia
mg/m³
40
35
30
25
20
15
10
5
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year
Measurement
Limit
Expon. (Measurement)


A8 TiB2 Firing Stack - Oxides of Nitrogen
mg/m³
120
100
80
60
40
20
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year
Measurement
Limit
Linear (Measurement)





3.2 – Annual Production

Titanium diboride powder: 12 tonnes

Boron nitride powder: 71 tonnes

3.3 – Performance Improvements

3.2.1 Improvements in 2024

Energy efficiency

In 2024, there was a 14% decrease in energy efficiency (mWh/tonne product) when compared with 2023 data, partly due to reduction in production of TiB2 material and a slight increase of overhead energy use. Another factor in energy increase was due to another production center that was not included in the tonne product calculation.

Energy efficiency improvements made in 2024 include:

- replacement of a furnace VIP (electrical induction control) unit with more energy efficient version
- a reduction in firing times on our sinter furnaces

Further opportunities to improve energy efficiency are being considered for the future which include:

- Recycling of machine shop offcuts
- Installation of more energy efficient furnace technology
- Replacing other existing motors with more energy efficient type
- Further reduction in firing and drying process times

The final product continues to have 28-31% reclaim material included. Material that would otherwise, require consumption of more raw materials and energy for production.

Waste

In 2024, the amount of waste (by weight) produced per ton of product was approximately 1% less than in 2023.

Material from laboratory samples continues to be recycled back into the process however, this is unfortunately no longer the case for filter dust as this was causing quality issues with the product.

Used evaporator boats continue to be retrieved from the customer and sent to China for re-cycling. This is approximately 36 tonne per year that would otherwise go to landfill.

The biggest opportunity for reducing the quantity of waste going to landfill would be to recycle the waste graphite from our powder production processes. Previous discussions with waste vendors have proved unsuccessful due to contamination

concerns. We are yet to find a solution to this, but potential solutions continue to be explored.

Water

In 2024, the amount of water consumed per tonne of product was 17% more than in 2023. This increase was partly due to increased scrubber unit water consumption.

Site Protection & Monitoring Programme (SPMP)

The Site Protection and Monitoring Programme has been reviewed in 2024. No changes to the plan have been made as the plan remains adequate and applicable to current circumstances. There have been no significant changes to our operations over the years which would require any changes to the plan.