Eskom

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Date
28 June 2022

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Dear Mrs Mpho Nembilwi

Ref Kendal Power Station AEL (17/4/AEL/MP312/11/15)

KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF APRIL 2022.

This is a monthly report required in terms of Section 7 4 in the Kendal Power Station's Atmospheric Emission License The emissions are for Eskom Kendal Power Station

Compiled by:

Irene Motswenyane
ENVIRONMENTAL OFFICER- KENDAL

Date: 28/06/2022

Supported by:

Solly Chokoe
ENVIRONMENTAL MANAGER- KENDAL

Date: 28/06/2022

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KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTHS OF APRIL 2022.

Verified by:

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BOILER ENGINEERING: SYSTEM ENGINEER- KENDAL

Date: 28/06/2022

Validated by:

Tendani Rasivhetshele
ACTING BOILER ENGINEERING MANAGER-KENDAL

Date 29/06/2022

Supported by:

Nonhlanhla Khumalo
ACTING ENGINEERING MANAGER-KENDAL

Date 29/06/2022

Approved by:

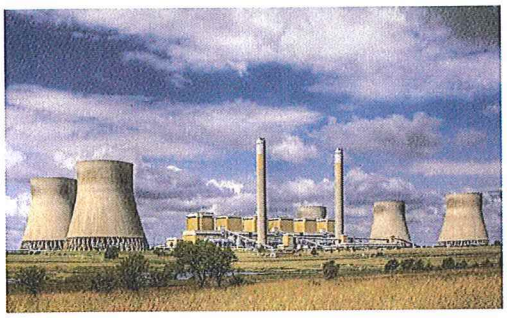
Lukhanyo Ndube
GENERAL MANAGER-KENDAL

Date
2022-07-2022

Eskom APRIL 2022 REV 01

KENDAL POWER STATION MONTHLY EMISSIONS REPORT

Atmospheric Emission License 17/4/AEL/MP312/11/15



1 RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Maximum Permitted Consumption Rate	Consumption Rate Apr-2022
	Coal	Tons	*2 260 000*	*825 781*
	Fuel Oil	Tons	*5 000*	*3422,95*
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Production Rate Apr-2022
	Energy	MWh(MW)	*3,153,600(4380)*	*1 423 242,00*
	Ash	Tons	*770 000*	*275 645,7*
	RE Ash	kg/MWh	*not specified*	*0,500*

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	*<1 (%)*	*0,840*
Ash Content	%	*40 (%)*	*33,380*

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SOx	NOx
Unit 1	*100*	*3500*	*1100*
Unit 2	*100*	*3500*	*1100*
Unit 3	*100*	*3500*	*1100*
Unit 4	*100*	*3500*	*1100*
Unit 5	*100*	*3500*	*1100*
Unit 6	*100*	*3500*	*1100*

4 ABATEMET TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Efficiency Apr-2022	Technology Type	Utlization Apr-2022
Unit 1	ESP + SO_3	99,6%	SO_3	0,0%
Unit 2	ESP + SO_3	Off-line	SO_3	Off-line
Unit 3	ESP + SO_3	100,0%	SO_3	0,0%
Unit 4	ESP + SO_3	99,6%	SO_3	0,0%
Unit 5	ESP + SO_3	99,2%	SO_3	0,0%
Unit 6	ESP + SO_3	99,6%	SO_3	0,0%

Unit 1, 2,3,4,5 & 6 sulphur utilization readings not available because KEPDATA04 and KEPDATA05 failed. The hardware is being replaced

Note: ESP plant does not have bypass mode operation, hence plant 100% Utilised.

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO_2	NO	O_2
Unit 1	85,1	80,0	80,0	99,7
Unit 2	Off-line	Off-line	Off-line	100,0
Unit 3	100,0	100,0	100,0	99,3
Unit 4	98,6	100,0	99,7	93,5
Unit 5	87,6	100,0	100,0	100,0
Unit 6	95,2	100,0	99,6	61,1

Note: Unit 1 SOx,NO, tempterture and flow the monitor failed from the 12th until the 22nd and as a result QAL2 test results an average of the available data was used to report.
Unit 3 flow QAL2 tests results avarage was used because of the instrument failure and unit 6 oxygen is reading too high.

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of April 2022

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)	CO_2
Unit 1	102,9	4 159	1 272	303 546
Unit 2	Off-line	Off-line	Off-line	Off-line
Unit 3	14,0	2 051	771	158 510
Unit 4	141,2	2 348	580	136 746
Unit 5	405,4	3 316	1 437	357 438
Unit 6	199,0	3 230	1 149	303 443
SUM	862,50	15 104	5 210	1 259 685

Table 6.2: Operating days in compliance to PM AEL Limit - April 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1	20	2	0	4	6	76,1
Unit 2	Off-line	Off-line	Off-line	Off-line	Off-line	Off-line
Unit 3	22	1	0	0	1	53,7
Unit 4	17	7	0	6	13	136,0
Unit 5	18	5	0	6	14	241,5
Unit 6	15	7	0	7	14	150,7
SUM	92	22	0	23	48	

Table 6.3: Operating days in compliance to SOx AEL Limit - April 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SOx (mg/Nm³)
Unit 1	27	0	0	0	0	3 118,6
Unit 2	Off-line	Off-line	Off-line	Off-line	Off-line	Off-line
Unit 3	24	0	0	0	0	1 947,1
Unit 4	30	0	0	0	0	2 211,0
Unit 5	30	0	0	0	0	2 040,9
Unit 6	30	0	0	0	0	2 388,6
SUM	141	0	0	0	0	

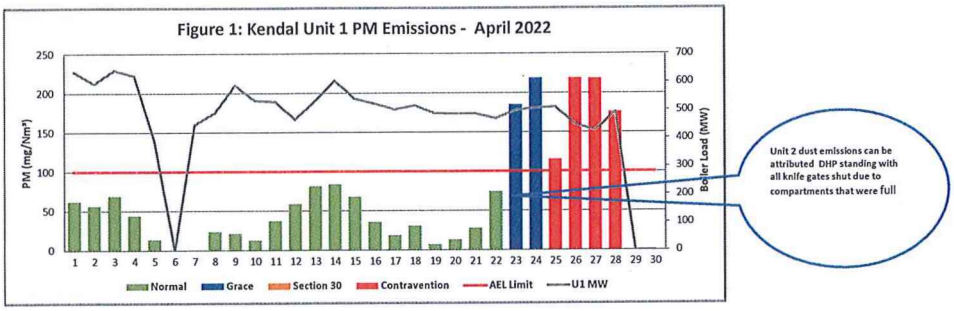
Table 6.4: Operating days in compliance to NOx AEL Limit - April 2022

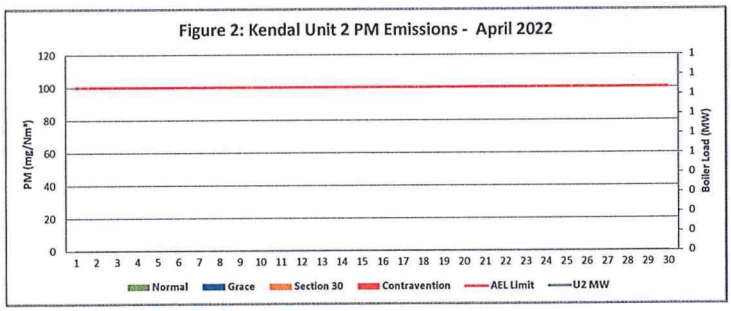
Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	27	0	0	0	0	952,7
Unit 2	0	Off-line	Off-line	Off-line	Off-line	Off-line
Unit 3	24	0	0	0	0	734,9
Unit 4	30	0	0	0	0	558,5
Unit 5	30	0	0	0	0	873,8
Unit 6	30	0	0	0	0	851,7
SUM	141	0	0	0	0	

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO_2

Table 6.5: Legend Description

Condition	Colour	Description
Normal		Emissions below Emission Limit Value (ELV)
Grace		Emissions above the ELV during grace period
Section 30		Emissions above ELV during a NEMA S30 incident
Contravention		Emissions above ELV but outside grace or S30 incident conditions





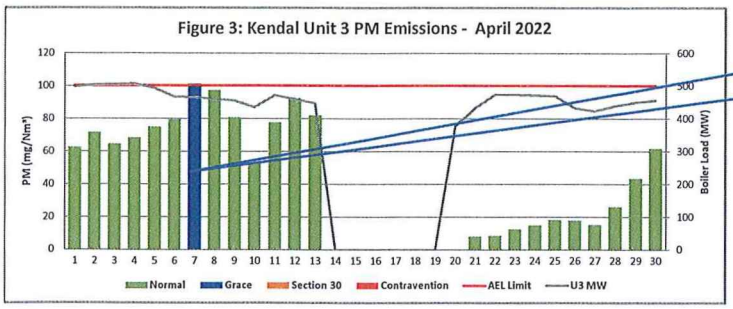


Figure 3: Kendal Unit 3 PM Emissions - April 2022
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U3 MW
High PM emissions can be attributed to precip conveyors 22&23 knife gates 1 checked in 30% open and precip fields having short circuits

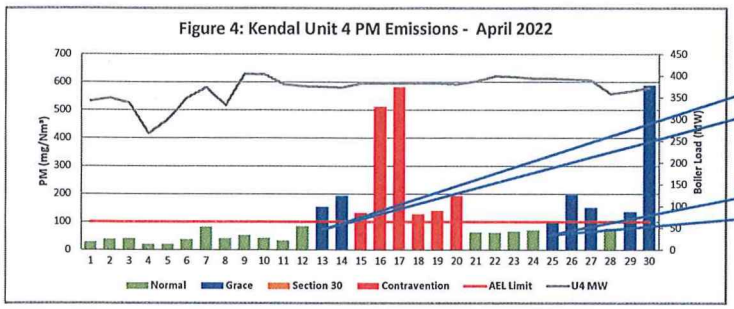


Figure 4: Kendal Unit 4 PM Emissions - April 2022
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U4 MW
High PM emissions can be attributed to DHP standing with all knife gates shut due to compartments that were full
High PM emissions can be attributed to

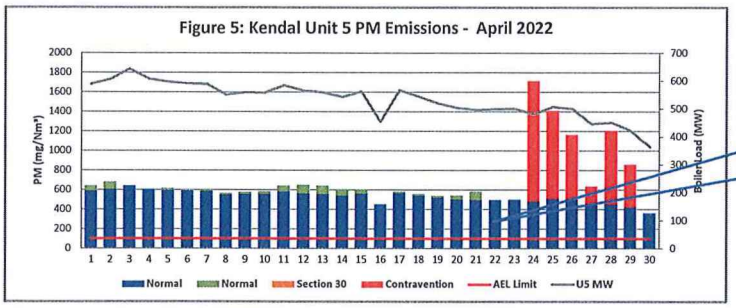


Figure 5: Kendal Unit 5 PM Emissions - April 2022
PM (mg/Nm³)
Boiler Load (MW)
Normal
Normal
Section 30
Contravention
AEL Limit
U5 MW
High PM emissions can be attributed to light up condition DHP standing with all knife gates shut due to compartments that were fulls

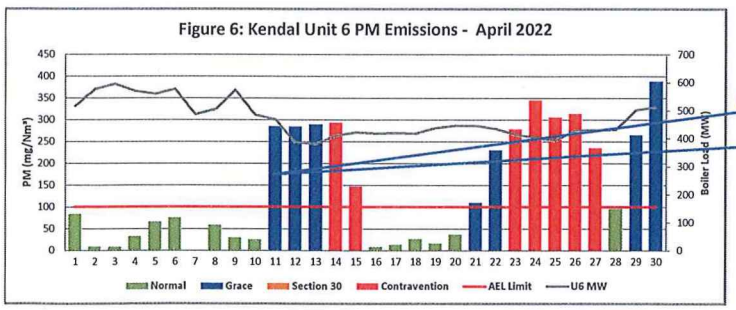


Figure 6: Kendal Unit 6 PM Emissions - April 2022
PM (mg/Nm³)
Boiler Load (MW)
Normal
Grace
Section 30
Contravention
AEL Limit
U6 MW
The high PM emissions can attributed to DHP standing, compartment levels high.

Figure 7: Kendal Unit 1 SOx Emissions - April 2022

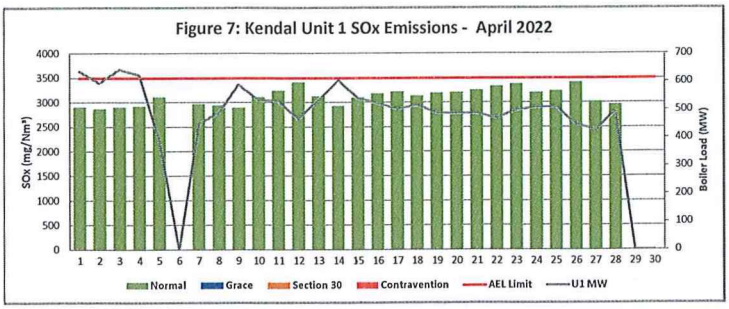


Figure 8: Kendal Unit 2 SOx Emissions - April 2022

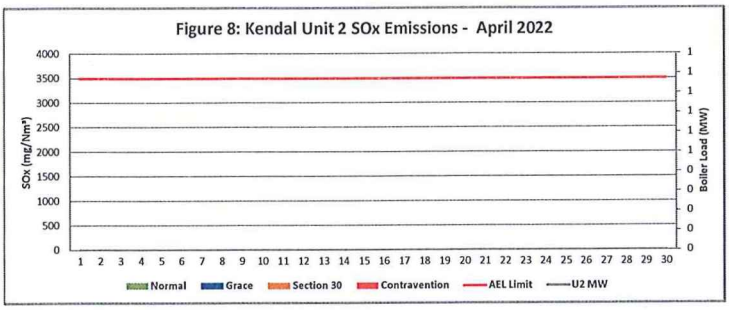


Figure 9: Kendal Unit 3 SOx Emissions - April 2022

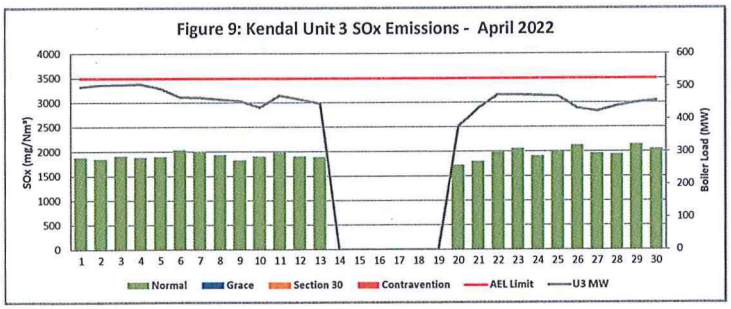


Figure 10: Kendal Unit 4 SOx Emissions - April 2022

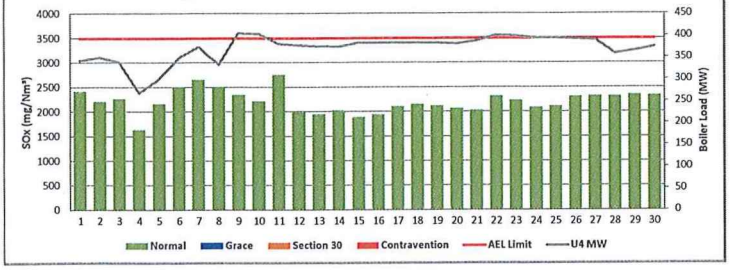


Figure 11: Kendal Unit 5 SOx Emissions - April 2022

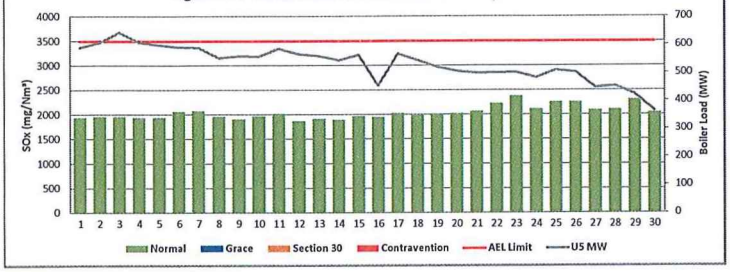


Figure 12: Kendal Unit 6 SOx Emissions - April 2022

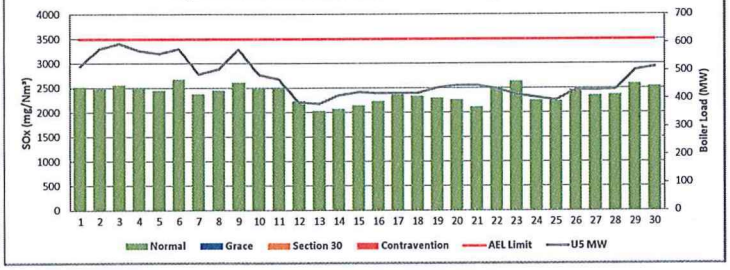
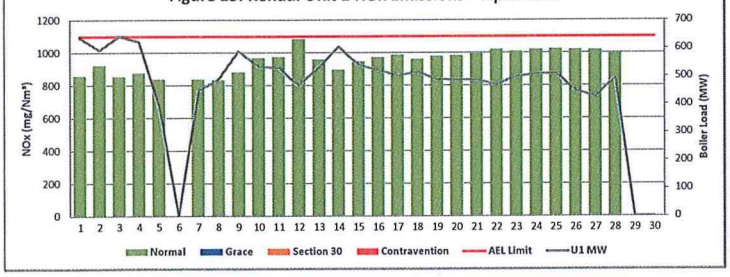
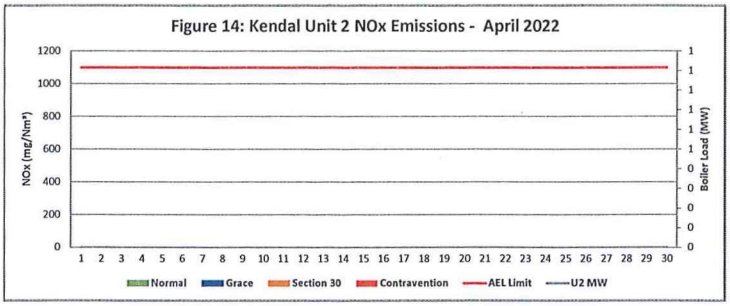
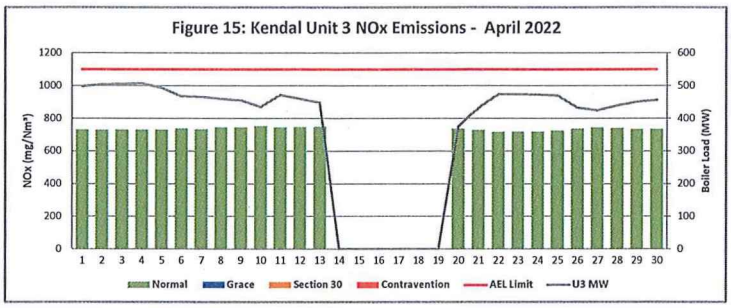
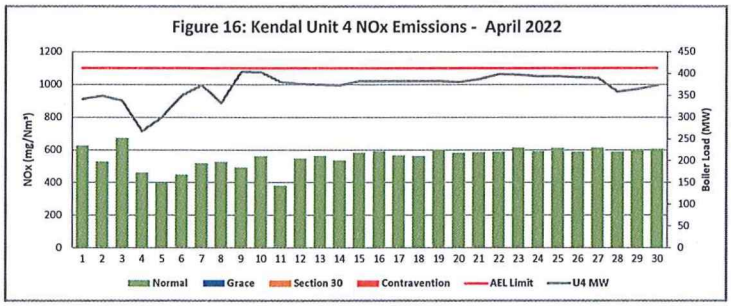


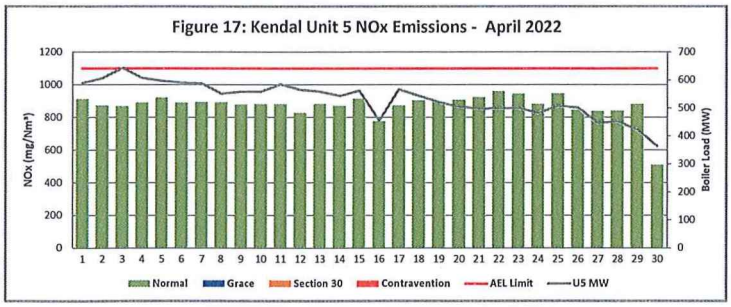
Figure 13: Kendal Unit 1 NOx Emissions - April 2022

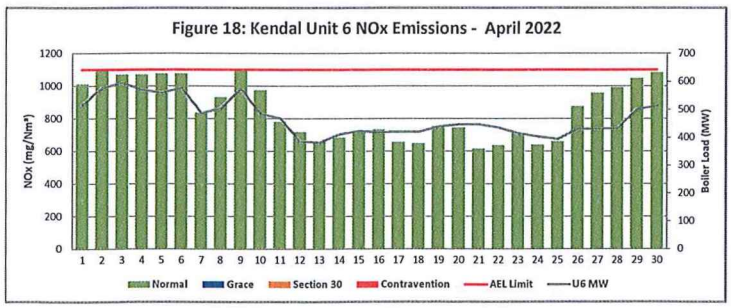












7 COMPLAINTS

There were no complaints for this months

Source Code / Name	Root Cause Analysis	Calculation of Impacts / emissions associated	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence

ADDENDUM TO MONTHLY EMISSIONS REPORT

Abatement Technology-Table 4

In order to achieve the required operational dust removal efficiency based on measured values, several assumptions such as
- Coal ash content (%) and burnt rate mass
- Fly : Coarse ash ratio of 80:20 - 80% of fly-ash mass obtained from burnt coal goes to ESP
- Measurement of dust emission by Dust Monitor over a period of time (monthly)

Operational Dust Removal Efficiency

$\eta = (1 - (Output/Input)) \times 100$

$\eta = 1 - \frac{(DustEmissionFromAQR\ ReportDustMonitor(tons)}{(CoalBurnt(tons) * \%AshContent * 80\%)} \times 100$

Monitor Reliability-Table 5

In terms of the minimum emissions standard, the requirement is that a monitor should be 80% reliable on a monthly average.
The **monitor reliability** refers to **data reliability** because the assumed value of 98% reliability is compared to the dust concentration signal. If the dust concentration signal is above 98% opacity,the data information is no longer reliable because the monitor reading is out of its maximum reading range. The data reliability looks at how many times did the dust concentration signal go above 98% over a period of time e.g 24hours
The formula is as follows:
= (1 – (count hours above 98%/24hours))x 100

Emissions Performance:

- Average velocity values from the latest correlation report were used on the gaseous emissions on Unit 1, 2, 3, 4 due to defective CEMS monitors and velocity correction factors were set M=1 and C=0.
- Note: Unit 1 SOx,NO, temperture and flow the monitor failed from the 12th until the 22nd and as a result QAL2 test results an average of the vaialble data was used to report. Unit 3 flow QAL2 tests results were used because of the instrument failure.

Unit 1
Findings: Dust emissions can be attributed DHP standing with all knife gates shut due to compartments that were full
Resolution: The plant was fixed and ash backlogs were cleared.

Unit 3
Findings: Dust emissions can be attributed DHP standing with all knife gates shut due to compartments that were full.
Resolution: The plant was fixed and ash backlogs were cleared.

Unit 4
Findings: Dust emissions can be attributed DHP standing with all knife gates shut due to compartments that were full.
Resolution: The plant was fixed and ash backlogs were cleared.

Unit 5: Dust emissions can be attributed DHP standing with all knife gates shut due to compartments that were full .
Resolution: The plant was fixed and ash backlogs were cleared.

Unit 6
Findings: Dust emissions can be attributed DHP standing with all knife gates shut due to compartments that were full.
Resolution: The plant was fixed and ash backlogs were cleared.