Eskom

Ms Nompulelo Simelane
Nkangala District Municipality
PO BOX 437
Middelburg
1050

Date:
25 October 2023

Enquiries:
Livhuwani Tshilate
017 615 2317

Ref*:* 17/4/AEL/MP312/11/09

Dear Ms. Simelane

KRIEL POWER STATION'S MONTHLY STACK EMISSIONS REPORT FOR THE MONTH OF SEPTEMBER 2023

This serves as the monthly report required in terms of Section 7.4 in Kriel Power Station's Atmospheric Emission License 17/4/AEL/MP312/11/09. The emissions are for the month of September 2023. Verified emissions of particulates matter, SO_2 and NO_x (as NO_2) are also included.

Raw Materials and Products

Table 1: Quantity of Raw Materials and Products used/produced for the month of September 2023

Raw Materials and Products used	**Raw Material Type**	**Units**	**Maximum Permitted Consumption / Rate (Quantity)**	**Consumption / Rate in Month of September 2023**
	Coal	Tons/month	1 227 600	673 566.20
	Fuel Oil	Tons/month	5 000	1093.377
Production Rates	**Product/ By-Product Name**	**Unit**	**Maximum Production Capacity Permitted (Quantity)**	**Production Rate in Month of September 2023**
	Ash	Tons/month	not specified	1355.65
	RE PM	kg/MWh	not specified	1.11

1/…

Abatement Technology

Table 2: Abatement Equipment Control Technology for September 2023.

Associated Unit/Stack	Technology Type	Actual Efficiency (%) September 2023	Utilisation September 2023
Unit 1	ESP	97.86%	0.10%
Unit 2	ESP	Unit offline	Unit offline
Unit 3	ESP	97.94%	95.11%
Unit 4	ESP	Unit offline	Unit offline
Unit 5	ESP	99.18%	100.0%
Unit 6	ESP	99.66%	100.0%

Energy Source Characteristics

Table 3: Energy Source Material Characteristics for the month of September 2023

Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6-1.2 (%)	0.760
Ash Content	27-32 (%)	26.400

Monthly Monitor Reliability

Associated Unit/Stack	PM (%)	SOx (%)	NOx (%)
North	80.98	97.40	100.00
South	91.39	52.03	100.00

Emissions Reporting

Table 6.5: Graph 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

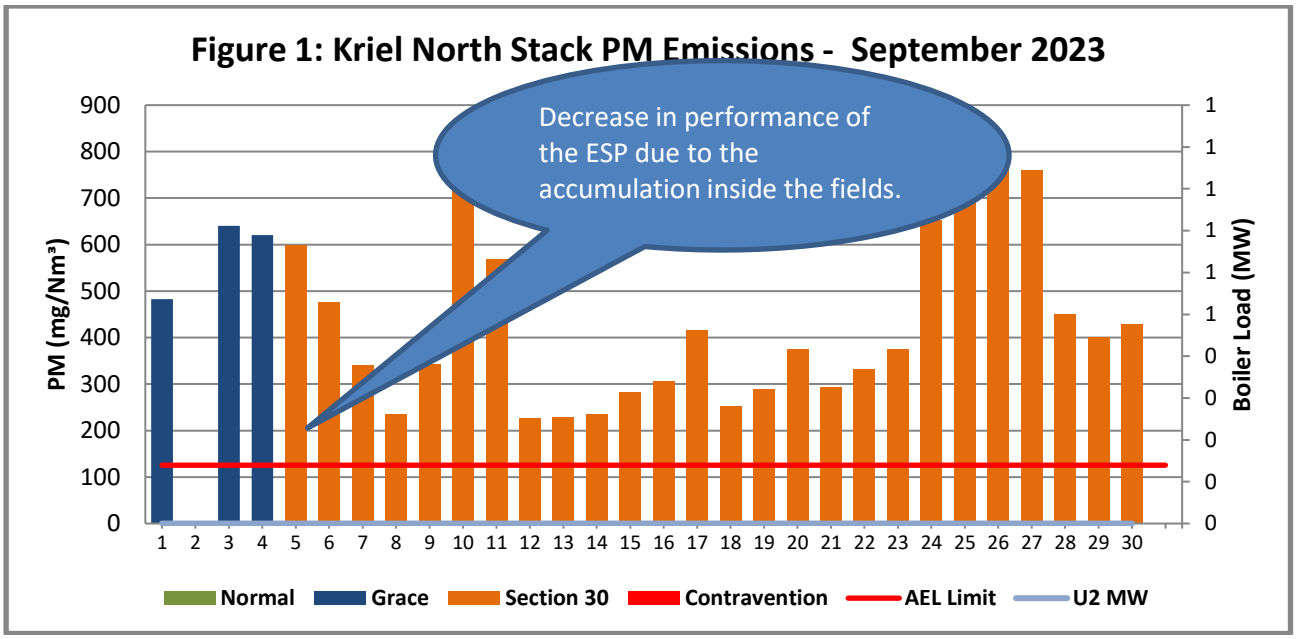

Figure 1: PM emissions for the month of September 2023 against emission limit for the North Stack. Monthly average was 453.2 mg/Nm3

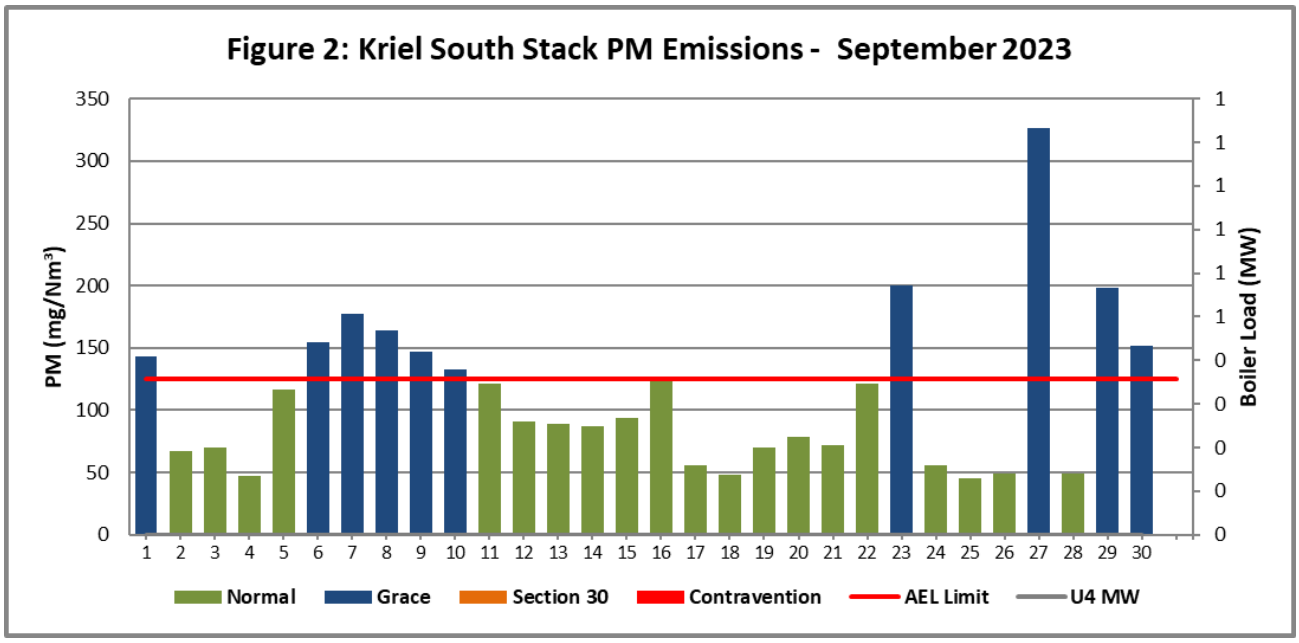

Figure 2: PM emissions for the month of September 2023 against emission limit for the South Stack. Monthly average was 111.6 mg/Nm3

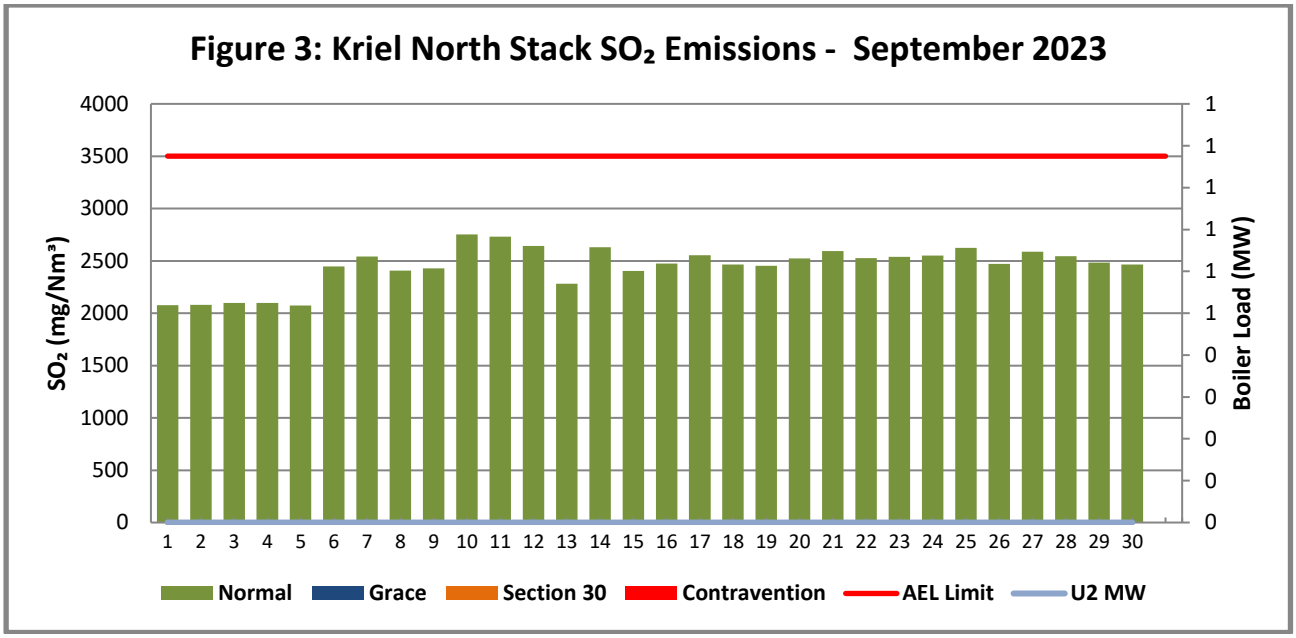

Figure 3. SO_2 emissions for the month of September 2023 against emission limit for the North Stack. The SOx Limit is 3500mg/Nm3.

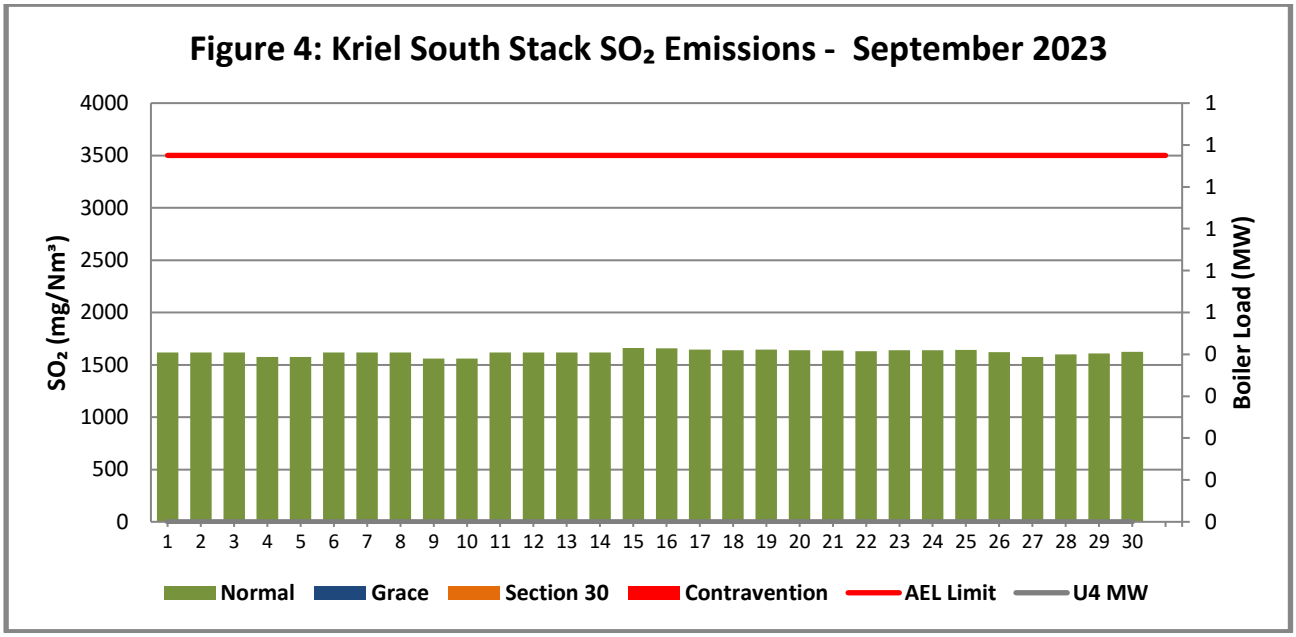

Figure 4. SO_2 emissions for the month of September 2023 against emission limit for the South Stack. The SOx Limit is 3500mg/Nm3.

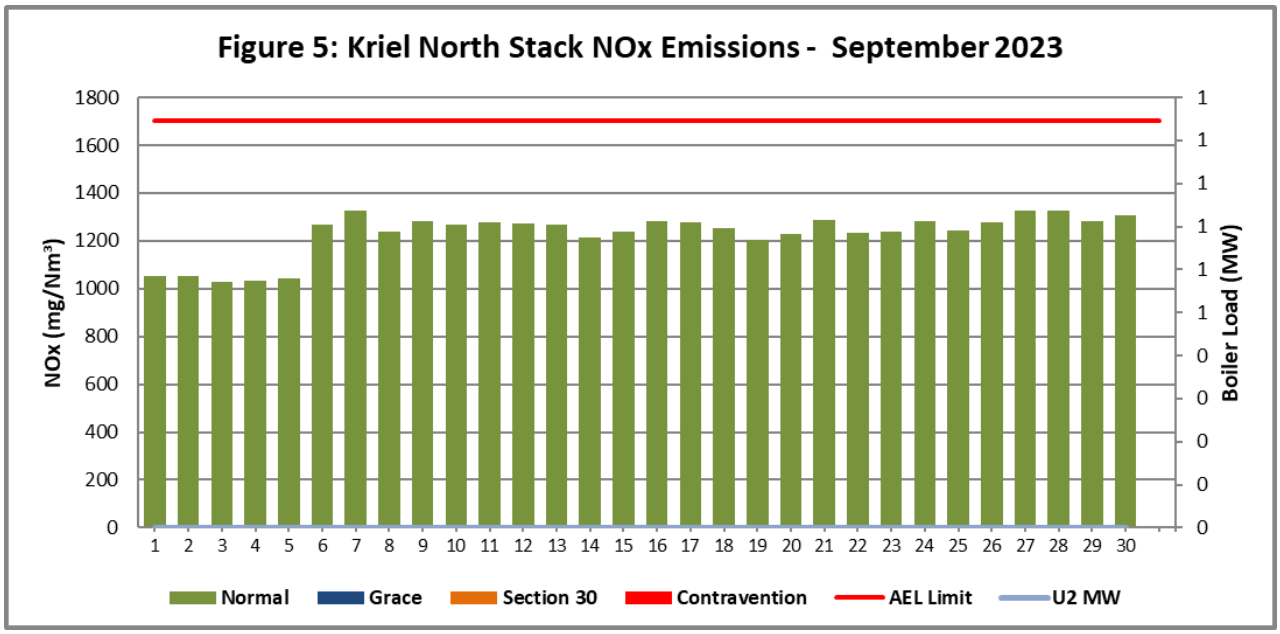

Figure 5. NO_2 emissions for the month of September 2023 against emission limit for the North Stack. The NOx Limit is 1600mg/Nm3.

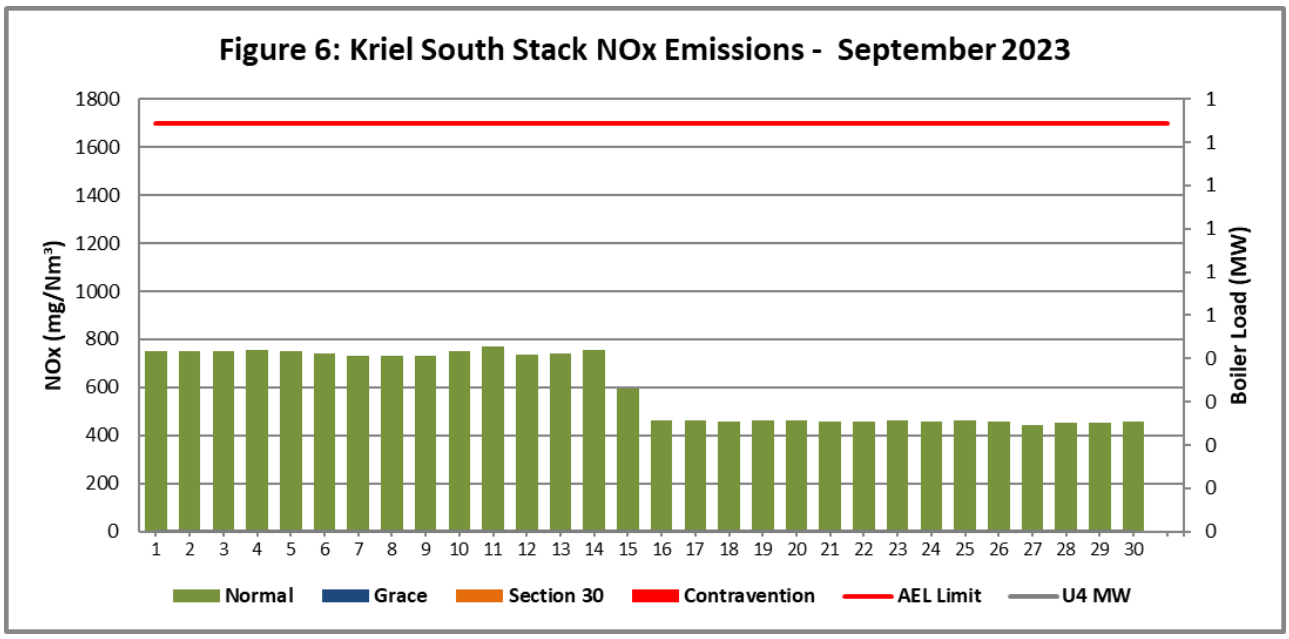

Figure 6. NO_2 emissions for the month of September 2023 against emission limit for the South Stack. The NOx Limit is 1600mg/Nm3.

Table 4: Monthly tonnages for the month September 2023

Unit	PM (tons)	SO_2 (tons)	NO_2 (tons)
SUM	1355.6	10601.3	4720.1

Table 5: Each unit and respective days operating under normal operation and section 30 days respectively

Table 5.1: Operating days in non-compliance to PM AEL Limit – September 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Monthly Limit Exceedance	Average PM (mg/Nm³)
North	01	03	26	0	29	453.2
South	20	10	0	0	10	111.6

Table 5.2: Operating days in compliance to SOx AEL Limit - September 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SOx (mg/Nm³)
North	30	0	0	0	0	2 451.4
South	30	0	0	0	0	1618.7

Table 5.3: Operating days in compliance to NOx AEL Limit – September 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
North	30	0	0	0	0	1 230.3
South	30	0	0	0	0	597.0

Light up information

Table 6: PM Start-up information for the month of September 2023

North Stack	*Event 1*		*Event 2*		*Event 3*		*Event 4*	
Unit No.	*no event*		*Unit 1*		*Unit 3*		*no event*	
Breaker Open (BO)					*9:45 pm*	*2023/09/01*		
Draught Group (DG) Shut Down (SD)					*10:00 pm*	*2023/09/01*		
BO to DG SD (duration)		DD: HH:MM		DD: HH:MM	*00:00:15*	DD: HH:MM		DD: HH:MM
Fires in time			*3:20 am*	*2023/09/04*	*2:40 am*	*2023/09/02*		
Synch. to Grid (or BC)			*2:50 pm*	*2023/09/04*	*6:40 am*	*2023/09/02*		
Fires into BC (duration)		DD: HH:MM	*00:11:30*	DD: HH:MM	*00:04:00*	DD: HH:MM		DD: HH:MM
Emissions below limit from BC (end date)			*not > limit*	*not > limit*	*not > limit*	*not > limit*		
Emissions below limit from BC (duration)		DD: HH:MM	*n/a*	DD: HH:MM	*n/a*	DD: HH:MM		DD: HH:MM

South Stack	Event 1		Event 2		Event 3		Event 4	
Unit No.	no event		Unit 6		no event		no event	
Breaker Open (BO)			12:35 pm	2023/09/04	10:10 am	2023/09/28	4:30 pm	2023/09/29
Draught Group (DG) Shut Down (SD)			3:10 am	2023/09/05	12:55 pm	2023/09/28	8:15 pm	2023/09/30
BO to DG SD (duration)		DD: HH:MM	00:14:35	DD: HH:MM	00:02:45	DD: HH:MM	01:03:45	DD: HH:MM
Fires in time			5:40 am	2023/09/09				
Synch. to Grid (or BC)			3:45 pm	2023/09/09				
Fires into BC (duration)		DD: HH:MM	00:10:05	DD: HH:MM		DD: HH:MM		DD: HH:MM
Emissions below limit from BC (end date)			not > limit	not > limit				
Emissions below limit from BC (duration)		DD: HH:MM	n/a	DD: HH:MM		DD: HH:MM		DD: HH:MM

Complaints Register

Table 9: Complaints for the month of September 2023.

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
There was no complaint related to air quality received during the month of September 2023.					

General

The particulate matter (PM10) emissions on the North Common Stack exceeded the **monthly limit**; on average emissions figure of **453.2 mg/Nm³** while South Common Stack was within the **monthly limit** on the recorded PM10 monthly average figure of **111.6 mg/Nm³**. The gaseous (NOx & SOx) emissions on the North and South common Stacks were within the **daily limit** during the month of September 2023; refer to graphs above.

NB: The rest of the information demonstrating compliance with the emissions license conditions is supplied in the annual emission reports sent to your office.

Kriel Power Station's List of NEMA Section 30 Incidents for 2023/2024 Financial Year

Month	Description of Section 30 Incidents - including the reference number	Root Cause (s)	Status of S30 Incident with DEFF (open or closed)	Remarks
April-2023	South Stack High Emissions	Unit 4 A EFP plant breakdown causing half load conditions which calls for operating the unit	Open	

		with fuel oil support to badly impacting the stack emissions		
May - 2023	North Stack High Emissions	Unit 4 A EFP plant breakdown causing half load conditions which calls for operating the unit with fuel oil support to badly impacting the stack emissions	Open	
May - 2023	South Stack High Emissions	Unit 4 A EFP plant breakdown causing half load conditions which calls for operating the unit with fuel oil support to badly impacting the stack emissions	Open	
June – 2023	North Stack High Emissions	Units operating at half load conditions which affects the sulphur dosing and causes the plant to operate with fuel oil support because of high turbine back pressure, low final feedwater temperature, high works power loss from high usage of electric feed pump and dust handling plant because of dust transportation resulting in high stack emissions	Open	

June - 2023	South Stack High Emissions	Units operating at half load conditions which affects the sulphur dosing and causes the plant to operate with fuel oil support because of high turbine back pressure, low final feedwater temperature, high works power loss from high usage of electric feed pump and dust handling plant because of dust transportation resulting in high stack emissions	Open	
July - 2023	North Stack High Emissions	The north stack emissions daily average has significantly reduced as results of shutting of unit 2 outage for the planned GO outage. However, due to the isolation of cooling tower number 2 for the cooling tower fills replacement project, unit 3 is operating at low loads to condenser vacuum high. The half load conditions mean supporting the unit with oil burners to support combustion and sulphur trioxide (SO3) not in service. The south stack PM		

		emission daily average has significantly reduced since synchronisation of units from half station shutdown.		
Aug - 2023	North Stack High Emissions	The north stack emissions exceedance was due to RH1 and RH2 poor field performance (high spark rates) which resulted in ESP reduced collection efficiency. The reduced field performance on the first field was as results of high hoppers, which resulted from an ash backlog on the dust handling plant.		
Sep - 2023	North Stack High Emissions	The North Stack emissions exceedance was due the increase of hopper alarms to 24 on Unit 1 due to blow tanks which were not available. Blow tank 1 2 discharge seal was damaged and blow tank 1 2 was leaking on the vent. Consequently, the electrostatic precipitators (ESP) performance decreased because of accumulation inside the fields.		

Oct - 2023				
Nov - 2023				
Dec - 2023				
Jan - 2024				
Feb - 2024				
Mar - 2024				