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Date:
23 July 2024

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Dear Ms. Nompumelelo Simelane

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

SUBMISSION OF KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF JUNE 2024.

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:

Tsakani Holeni
ENVIRONMENTAL SENIOR ADVISOR- KENDAL POWER STATION

Date: 23/07/2024

Supported by:

Solly Chokoe
ENVIRONMENTAL MANAGER- KENDAL POWER STATION

Date: 23/07/2024

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KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF JUNE 2024

Verified by:



Jacob Zwane

BOILER ENGINEERING: SENIOR SYSTEM ENGINEER- KENDAL POWER STATION

Date: 23/07/2024

Validated by:

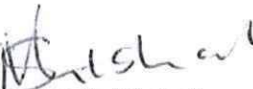


Tendani Rasivhetshela

BOILER ENGINEERING MANAGER-KENDAL POWER STATION

Date: 24/07/2024

Supported by:



Nomfundo Mtshali

ACTING ENGINEERING MANAGER-KENDAL POWER STATION

Date: 24/07/2024

Approved by:



Tshepiso Temo

GENERAL MANAGER-KENDAL POWER STATION

Date: 2024/07/24



JUNE 2024

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 Jun-2024
	Coal	Tons	2 260 000	802 319
	Fuel Oil	Tons	5 000	6764 120
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Indicative Production Rate Jun-2024
	Energy	GWh	2 963 520	1 399 217
	Ash	Tons	770 000	254 816 514
	RE Ash	kg/MWh	not specified	0 544

Note: Maximum energy rate is as per the maximum capacity stated in the AEL: [4 116 MW] x 24 hrs x days in Month/1000 to convert to GWh

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	16-24 (MJ/kg)	18 750
Sulphur Content	%	≤1 (%)	0 830
Ash Content	%	40 (%)	31 760

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO ₂	NO _x
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 ABATEMENT TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Efficiency Jun-2024	Technology Type	SO ₂ Utilization Jun-2024
Unit 1	ESP + SO ₂	99.305%	SO ₂	0.0%
Unit 2	ESP + SO ₂	99.401%	SO ₂	0.0%
Unit 3	ESP + SO ₂	99.921%	SO ₂	0.0%
Unit 4	ESP + SO ₂	99.821%	SO ₂	0.0%
Unit 5	ESP + SO ₂	Off-line	SO ₂	Off-line
Unit 6	ESP + SO ₂	99.673%	SO ₂	0.0%

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

There is no value for SO₃ utilization due to failed network application. The station is currently addressing the issue through the HMI replacement project.

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO	O ₂
Unit 1	89.4	58.9	58.9	99.7
Unit 2	81.5	68.6	68.6	99.9
Unit 3	92.0	100.0	100.0	98.5
Unit 4	100.0	100.0	98.8	100.0
Unit 5	Exempt	0.0	0.0	0.0
Unit 6	99.6	100.0	100.0	51.7

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO₂

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of June 2024

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	285.5	2 733	1 125
Unit 2	244.2	3 647	1 965
Unit 3	34.6	2 663	1 025
Unit 4	71.6	2 362	842
Unit 5	Exempt	0	0
Unit 6	125.3	2 967	1 513
SUM	761.16	14 371	6 470

Table 6.2: Operating days in compliance to PM AEL Limit - June 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contraven- tion	Total Exceedance	Average PM (mg/Nm³)
Unit 1	21	2	0	2	4	199.6
Unit 2	3	3	0	16	19	177.0
Unit 3	2	1	0	0	1	28.4
Unit 4	13	0	0	0	0	50.5
Unit 5	Exempt	Exempt	Exempt	Exempt	Exempt	Exempt
Unit 6	16	0	0	0	0	97.7
SUM	55	6	0	18	24	

Table 6.3: Operating days in compliance to SO₂ AEL Limit - June 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contraven- tion	Total Exceedance	Average SO ₂ (mg/Nm³)
Unit 1	28	0	0	0	0	1 714.3
Unit 2	28	0	0	0	0	2 455.7
Unit 3	25	0	0	0	0	1 953.2
Unit 4	27	0	0	0	0	1 623.4
Unit 5	0	0	0	0	0	
Unit 6	21	0	0	0	0	2 234.9
SUM	129	0	0	0	0	

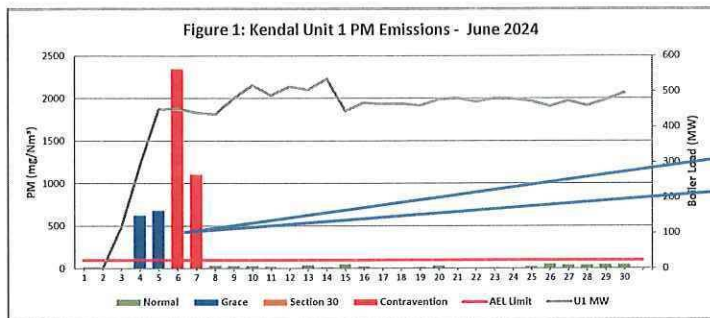
Table 6.4: Operating days in compliance to NOx AEL Limit - June 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	28	0	0	0	0	705.5
Unit 2	3	0	0	25	25	1 302.8
Unit 3	25	0	0	0	0	750.1
Unit 4	27	0	0	0	0	566.0
Unit 5	0	0	0	0	0	
Unit 6	6	0	0	15	15	1 149.8
SUM	89	0	0	40	40	

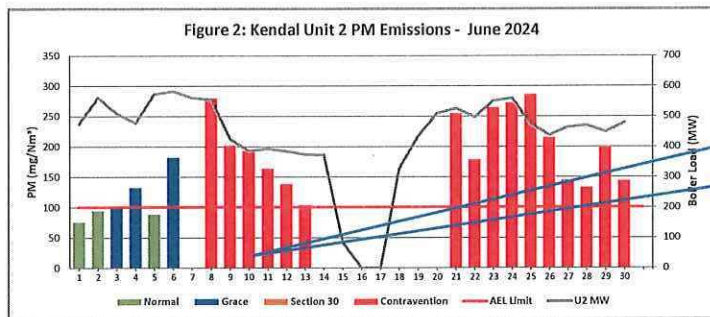
Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO₂

Table 6.5: Legend Description

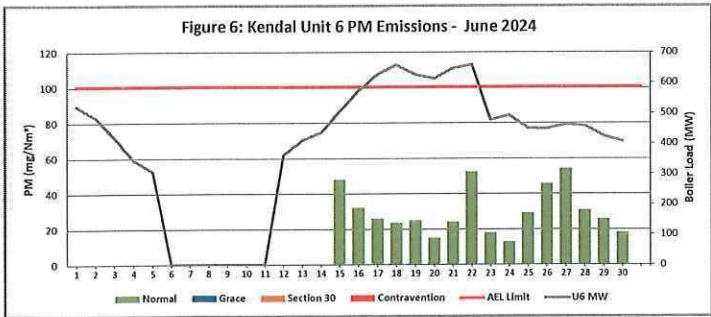
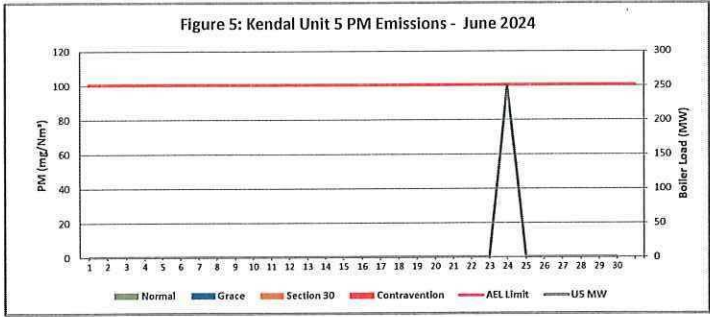
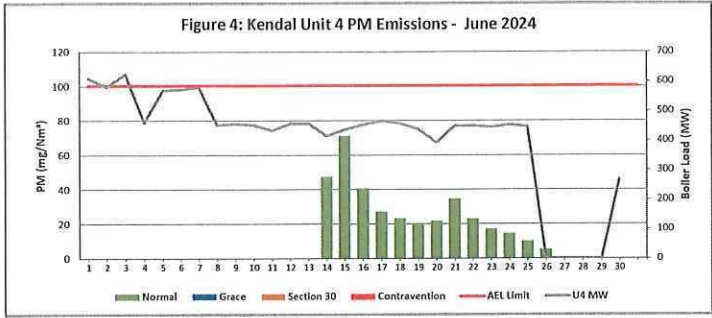
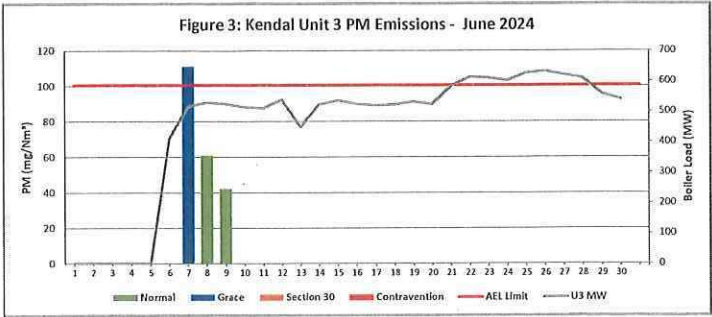
Condition	Colour	Description
Normal	GREEN	Emissions below Emission Limit Value (ELV)
Grace	BLUE	Emissions above the ELV during grace period
Section 30	ORANGE	Emissions above ELV during a NEMA S30 incident
Contravention	RED	Emissions above ELV but outside grace or S30 incident conditions

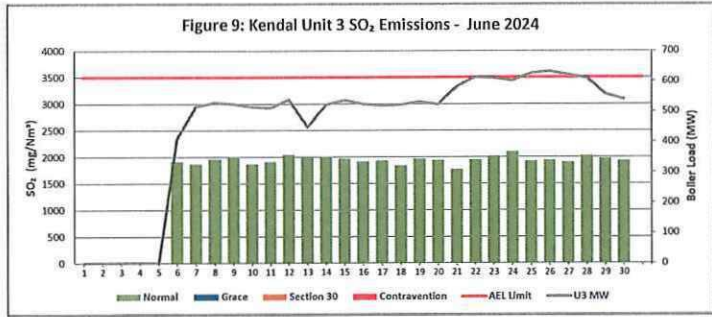
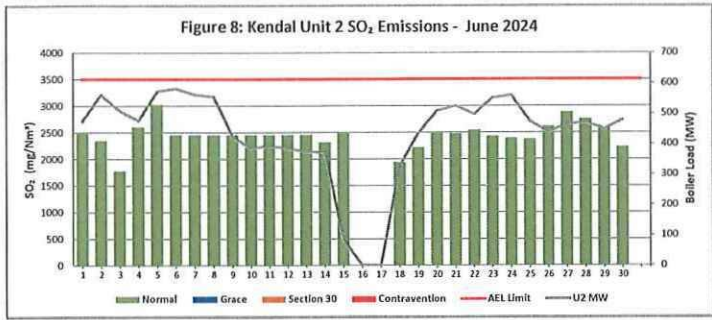
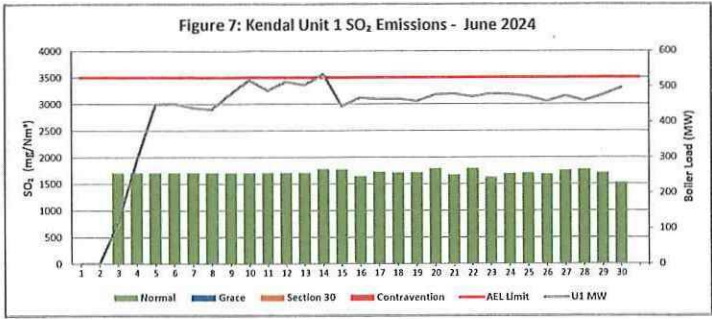


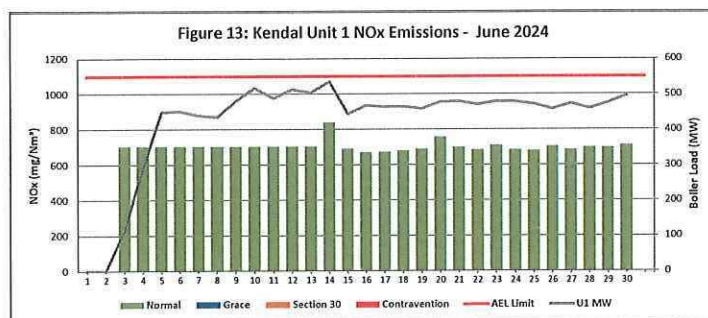
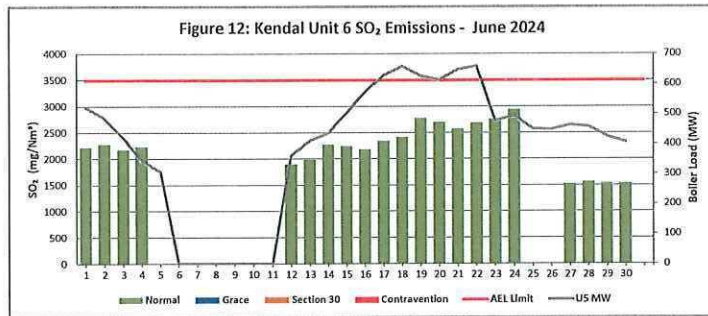
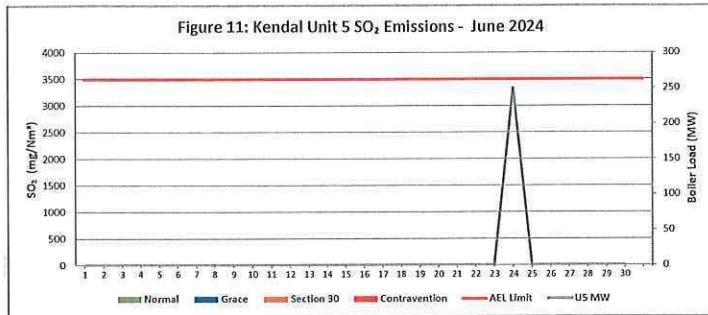
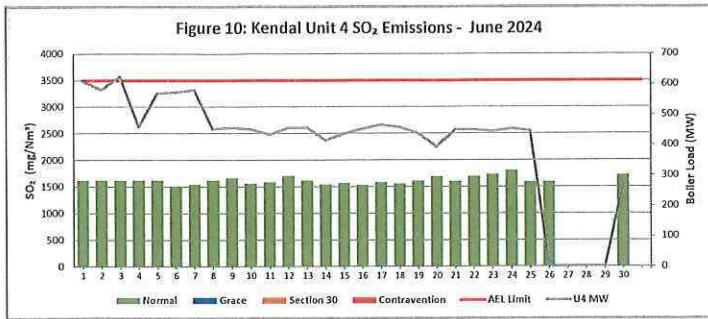
High emissions can be attributed to the DHP that was Standing due to compartment high levels, Light up condition - Hot start, So3 injection rate was also at 0 ppm and also due to Field 39 high primary current.

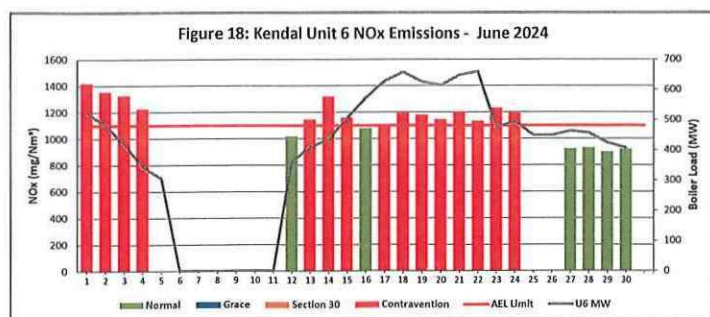
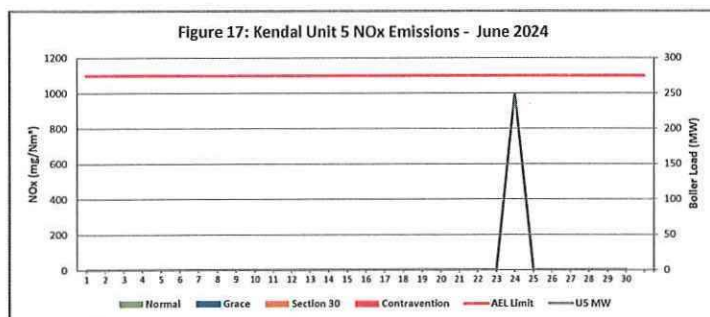
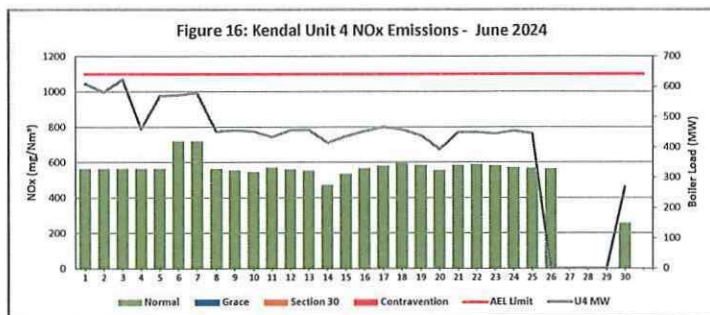
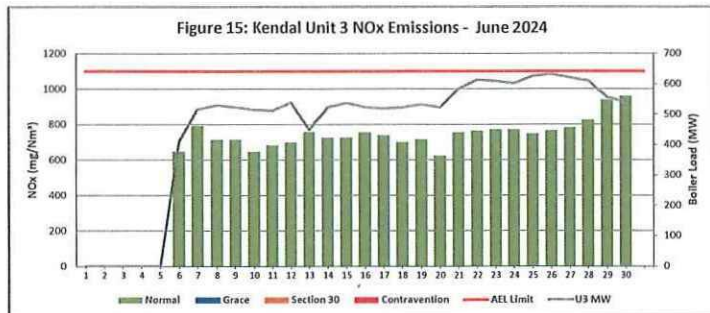
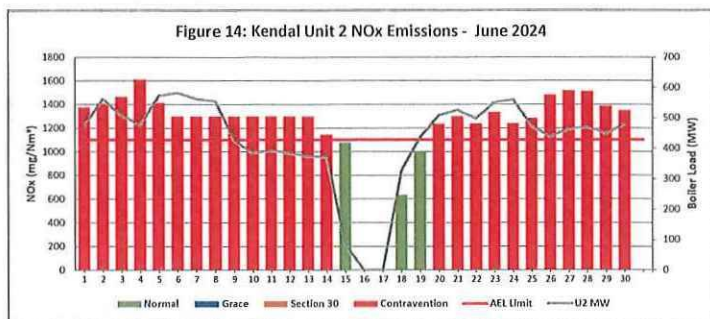


High emissions can be attributed to F11 Internal structural problem, F13,27,31 secondary voltage was low, F44 was on permit, DHP standing due to compartment high levels and Precip conveyor 13 was standing, F12,22,32,42 CE Rapper 2 LH & RH was tripping on overload, F11 Internal structural problem, F13,27,31,41 secondary voltage was low and F44 was on permit.









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

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

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

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

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 99.325% reliability is compared to the dust concentration signal. If the dust concentration signal is above 99.325% 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 24 hours

The formula is as follows:

$$= (1 - (\text{count hours above 99.325\%/24hours})) \times 100$$

Emissions Performance:

- Average velocity values from the latest correlation report were used on the gaseous emissions on Unit 1, 2,4,5 &6 due to defective CEMS monitors and velocity correction factors were set M=1 and C=0
- Unit 1 and 2 maxed out, meaning the emissions were higher than what the monitor was correlated for, in which case we use surrogate values. This is attributed to abnormal plant conditions.
- Please note that the reported figures in tonnage calculation are the figures after the station used the maxing out quantification exercise which is the use of "surrogate values" on days when the monitor maxed out. the following are the days when the monitor maxed out: Unit 1 from the 6th to the 7th and Unit 2 from the 7th to the 8th, 19th to the 26th.
- Unit 1 Nox and SOX, Temperature and Pressure were not reading from the 30th of May to the 14th of June at 11:35.
- Power failed on stack 2 (Unit 4 to 6) and after recovery of the power it was found that the module on GM32 was damaged and the module was replaced.
- Unit 2 NOX and SOX, Temperature and pressure from 5 June at 17:10 to 14 June at 11:40 were not reading because the Power failed and after recovery of the power it was found that the module on GM32 was damaged and the module was replaced.
- Unit 3 O2 and flow from the 1st of June to the 5th June at 17:40 was not reading due to O2 that was faulty.
- Flow was not working on unit 6 for the whole month due to corroded flow sensor caused by the transducer that was damaged and the transducer was then replaced replaced.
- Unit 1
- Findings: The high emissions can be attributed to the DHP that was Standing due to compartment high levels, Light up condition - Hot start, So3 injection rate was also at 0 ppm and also due to Field 35 high primary current.
- Resolution: Plant repaired
- Unit 2
- Findings: The high emissions can be attributed to F11 internal structural problem, F13,27,31 secondary voltage was low, F44 was on permit, DHP was standing due to compartment high levels and Precip conveyor 13 was standing. F12,22,32,42 CE Rapper 2 LH & RH was tripping on overload, F11 internal structural problem, F13,27,31,41 secondary voltage was low and F44 was on permit.
- Resolution: Plant repaired.
- Unit 3
- Unit was compliant
- Unit 4
- Unit was compliant on most of the days of the month.
- Unit 5
- Unit was off the whole month.
- Unit 6
- Unit was compliant on most days of the month.